

Watson SJ, Zizzo DJ, Fleming P. [*Determinants and Welfare Implications of Unlawful File Sharing: A Scoping Review*](#). CREAtE, 2014.

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DOI link to article:

<https://doi.org/10.5281/zenodo.8553>

Date deposited:

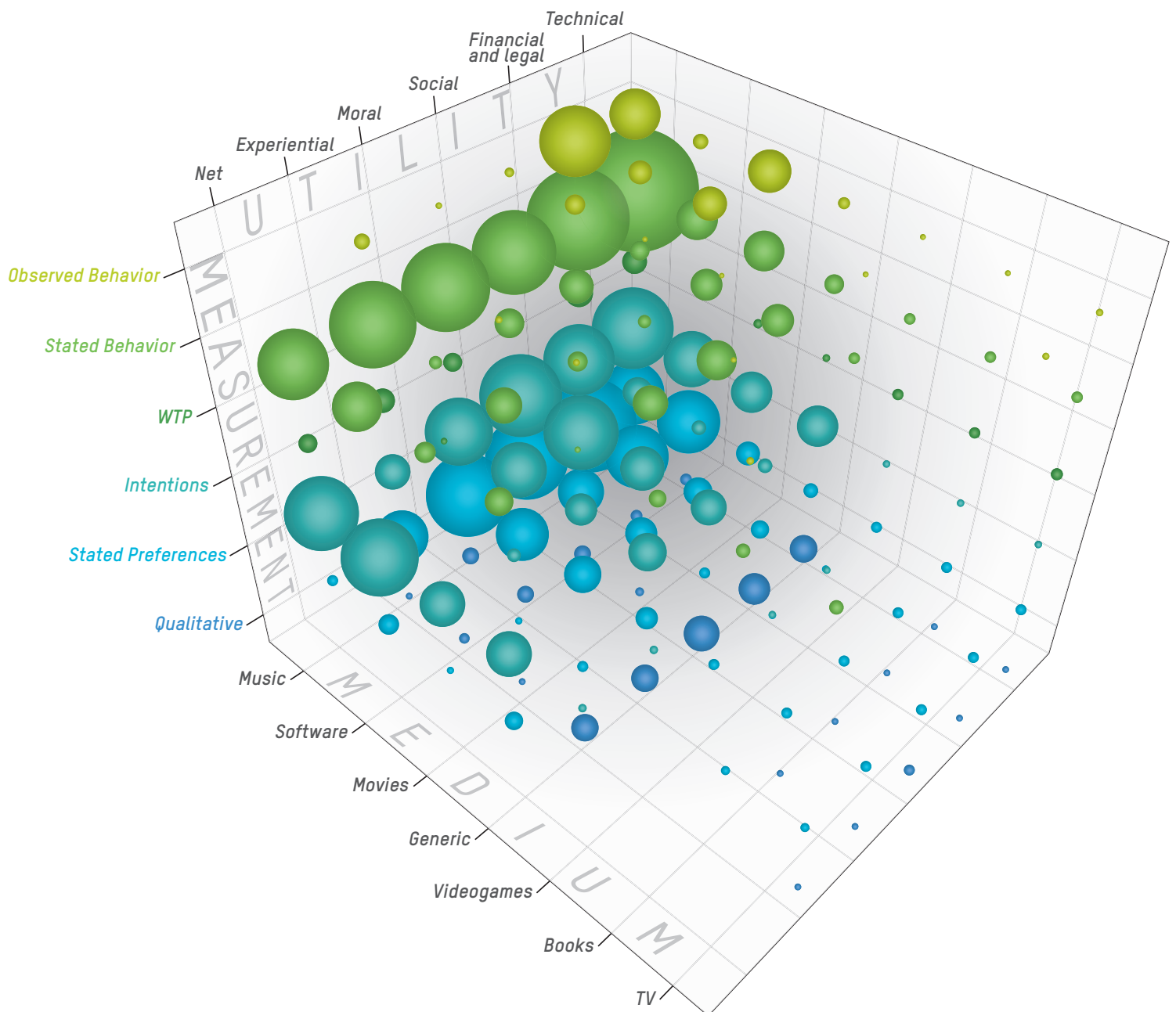
14/02/2018



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DETERMINANTS AND WELFARE IMPLICATIONS OF UNLAWFUL FILE SHARING

A SCOPING REVIEW



CREATE



University of
East Anglia

Determinants and Welfare Implications of Unlawful File Sharing: A Scoping Review

Authors

Steven James Watson*
Lancaster University
s.watson3@lancaster.ac.uk

Daniel John Zizzo
University of East Anglia
d.zizzo@uea.ac.uk

Piers Fleming
University of East Anglia
p.fleming@uea.ac.uk

Digital Object Identifier (DOI): 10.5281/zenodo.8553

* Corresponding author. E-mail address: s.watson3@lancaster.ac.uk (S.J. Watson). The research was conducted while Steven Watson was at the University of East Anglia. The authors wish to acknowledge the assistance of Martin Kretschmer and Lilian Edwards for helping to refine the scope of this review as well as helping to identify sources of grey literature. Joost Poort provided advice which also helped to refine the scope of the review; Elisavet Patouris and Harriet Miller provided research assistance with regard to the design of the data extraction form and the collection of data; Axel Sonntag provided assistance with the figures; Martin Kretschmer helped refine the terminology. Earlier drafts of this report have benefitted from comments from Brett Danaher, Martin Kretschmer, Derek McAuley, Joost Poort and Michael Smith. We thank participants at the CREATE “UK Music and Academics” seminar hosted by UK Music on the 6th September 2013, and a CREATE BFI meeting on the 8th January 2014 for feedback on presentations of this research. We also acknowledge the assistance of authors and research staff that responded to requests for information or access to their research.

Funding for this project was from the RCUK via the Centre for Copyright and New Business Models in the Creative Economy (CREATE), AHRC Grant Number AH/K000179/1, and from the University of East Anglia. The usual disclaimer applies.

Abstract

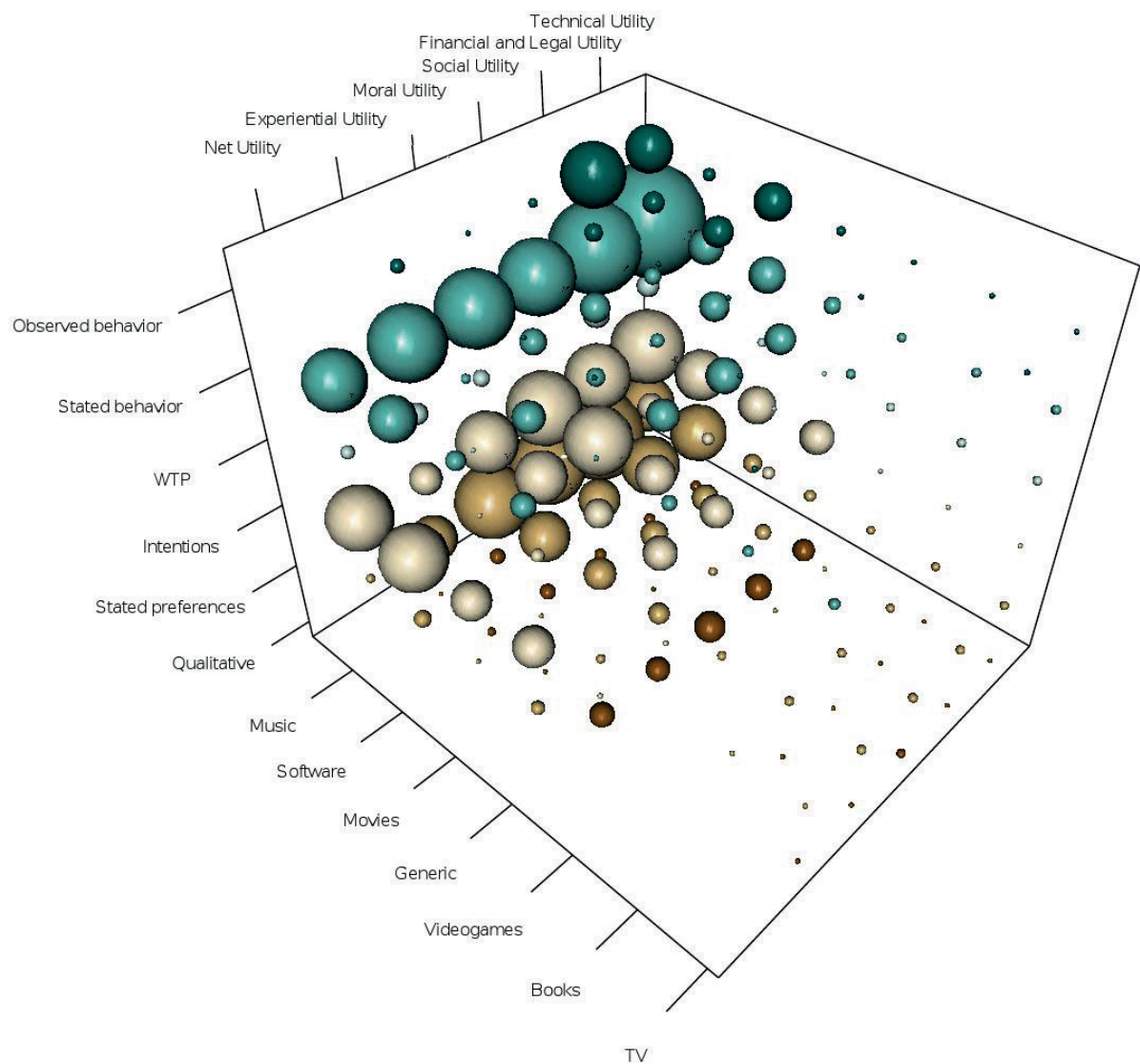
We employ an innovative scoping review methodology to consider and assess the existing evidence on the consequences and determinants of unlawful file sharing (UFS) transparently and systematically. We complement this with a simple conceptual framework to model the decision to engage in UFS and to map out the existing evidence. Whether UFS is good or bad for welfare remains unclear. Regarding determinants of UFS, studies that employ observed behavior as a measured outcome remain few, and fewer still for potential moral, experiential and social determinants. More experimental and longitudinal studies assessing causality are needed.

Keywords: scoping review; digital media; file sharing; illegal downloads; welfare.

JEL Classification Codes: B41, D12, L82.

Executive Summary

- A scoping review was carried out to investigate and summarize the extent and nature of research (2003-2013) into the welfare implications and determinants of unlawful file sharing.
- Articles on unlawful file sharing for digital media including music, film, television, videogames, software and books, were methodically searched for within academic databases and a pre-publication repository; non-academic literature was sought from key stakeholders and research centers.
- 54,441 sources were initially found with a wide search and were narrowed down to 206 articles which examined human behavior, intentions or attitudes.
- Whether unlawful file sharing confers a net societal cost or benefit to welfare remains unclear based on the available evidence, with both of the approaches employed – a) looking at the association between sales and unlawful file sharing, and b) examining people's willingness to pay with and without the possibility of unlawful file sharing – suffering from serious limitations.
- We provide a conceptual economic model to consider the factors that go into the decision whether to engage in unlawful downloads, legal purchases or neither. Potentially relevant factors relate to financial and legal utility, experiential utility, technical utility, social utility, and moral utility.
- The scoping review and the economic model allow us to identify a cubic representation of the volume of studies available on unlawful file sharing based on decision making factor (utility type), medium/market and type of measurement of unlawful file sharing (see figure on next page).



- The cubic representation illustrates the comparative scarcity of studies that employ observed behavior as a measured outcome, whether from the experimental laboratory or from the natural world. This is a problem, particularly as there is often a gap in findings between studies that use behavior and studies that do not.
- The vast majority of the studies employ cross sectional survey studies which make attributions of causality extremely difficult.
- The unlawful file sharing debate seems to have been predominantly determined by evidence from music files. Movies and software are a distant second. There is very little on videogames, books, or TV content. However, there is evidence to suggest that the determinants and welfare implications of one medium may not apply equally to another. Therefore there is a danger in basing policy decisions upon evidence heavily biased toward a single medium.

Potentially predictive factors

- Financial and Legal Utility: High prices appear to reduce sales but there is no clear evidence of an effect of price or income on unlawful file sharing. However, unlawful file sharing is associated with lower willingness to pay for content. Legal implications can be compared across countries and over time as new laws are introduced and in both cases stronger laws appear to reduce unlawful file sharing; however, there is limited behavioral data which could confirm a causal, legal effect.
- Experiential Utility: Unlawful file sharing may be influenced by a desire to sample new content, to access niche content, to build a collection or general interest in the content but there is a need for further evidence concerning these experiential factors.
- Technical Utility: Several accounts suggest an initial barrier to unlawful file sharing, such as availability of legal alternatives or perceived technical risks which reduce intent to file share. There is also a need for behavioral evidence to support initial indications that the relative availability of unlawful versus legal content, ease of unlawful file sharing, and technical ability, increase the likelihood of unlawful file sharing.
- Social Utility: There was correlational evidence that measures of individual unlawful file sharing were associated with measures of peer unlawful file sharing, but behavioral evidence is unavailable.
- Moral Utility: Moral beliefs were correlated with measures of reduced unlawful file sharing, but behavioral evidence is lacking.
- Demographics: Older people are less likely to engage in unlawful file sharing or to have positive attitudes about it.

1. Introduction

This paper has three objectives. First, we present a simple conceptual framework to model the decision to engage in the unauthorized consumption of copyright protected goods and to map out the existing available evidence regarding unlawful file sharing behavior (referred to as UFS hereafter). Second, we map out the existing available evidence employing a *scoping review* approach that aims to be as systematic and transparent as possible, and which we borrow from areas such as public health and social policy research (e.g., Crooks et al., 2009; Arksey and Malley, 2005). The application of a scoping review methodology to our context is in itself a methodological innovation of this paper. Third, and using the same scoping review methodology, we consider the welfare implications of UFS. In both cases, we are able to identify areas which require further empirical support in terms of the quantity and quality of available evidence.

The creative industries are worth £36.3 billion to UKs GVA, and account for approximately 5% of UK employment (DCMS, 2011). The digital economy alone supports approximately 270,000 businesses in the UK (Nathan et al., 2013). However, a number of these industries are purportedly at risk from the unlawful distribution of creative works over the internet. The use of file sharing networks to acquire content for free is an extremely common activity. It is estimated that one in six UK internet users consumes at least some content unlawfully online, with this figure rising to almost one in three when restricted to those that consume any content online (Ofcom, 2013). Furthermore the use of p2p file sharing networks alone is said to account for up to a third of all internet traffic (Peha and Mateus, in press). Given the popularity of UFS, it is no surprise that it has been claimed that unlawful file sharing has caused significant harm to legitimate distribution channels. It has been noted that the emergence of the first widely popular file sharing network, Napster, coincided with a significant decline in the sales of recorded music (Liebowitz, 2006). Moreover, it has been claimed that UFS could account for the entirety of this decline in music sales (Liebowitz, 2011). UFS has been reported as having a detrimental impact upon industry profits in other media too. Although movie industry profits have continued to grow during the period since UFS became commonplace, it has been suggested that file sharing networks have denied the industry even greater profits (Zentner, 2010). However it is not necessarily the case that UFS must lead to fewer legitimate sales. Files that are acquired unlawfully may not replace sales but may be of content that was never going to be purchased because it is valued less than content acquired legally (Rob and Waldfogel, 2006). It is also possible that UFS may increase sales, either by allowing consumers to sample content, to gain further information prior to purchase (Bhattacharjee et al., 2006a), or by raising awareness of content via word of mouth and other social networks (Takeyama, 1994).

There have been a number of previous reviews which have attempted to determine the impact of UFS upon the content industries. The bulk of the literature has identified a negative relationship between UFS and legal sales of music and movies (Dejean, 2009, Liebowitz, 2006, Png, 2006, Smith and Telang, 2012, Towse et al., 2008). However, it has also been suggested that there may be fundamental deficiencies in the data that the empirical studies' conclusions are based on (Towse et al., 2008). This report provides a more comprehensive

stock-take of the types of evidence that have been gathered to answer the question of what harm UFS has caused. We also provide some assessment as to the adequacy of the evidence whilst also identifying what types of question remain unanswered by the literature. Moreover, focusing entirely upon the question of whether UFS causes harm or not, and to what extent, has limited utility with regard to providing content creators and rights holders with strategies for maximizing legal sales. An equally important question may be to determine what research currently exists to explain the reasons why consumers choose to file share, or else choose to purchase when UFS is possible. If the mechanisms by which users choose to obtain content by different means are more fully understood, this raises the possibility of developing strategies that are able to compete with UFS more effectively by targeting services that cater to the specific needs of particular user groups (Bakker, 2005).

Section 2 explains what a scoping review is and why it is useful. In the scoping review process we began by considering 54,441 sources which, through a selection process described in section 3, were whittled down to the 206 sources which constitute the basis of our analysis. The conclusions of the empirical welfare analysis of the impact of UFS remain unclear, as study results are a function of the data collection process and neglect dynamic welfare effects (section 4). Section 5 presents our framework for the decision to engage in legal purchases or unlawful consumption: we model a utility function which depends on a number of sources considered by the existing research to be of potential relevance, including financial and legal, experiential, technical, social and moral ones. This enables us then to map out the existing evidence as a function of three dimensions (section 6): the type of utility; the market (music, software, movies, TV, books, videogames); and the outcome measurement (qualitative, stated preferences, intentions, willingness to pay, stated behavior and observed behavior). The most studied market is the music one for all utility types, with software being the second most studied market and a perhaps surprisingly small number of empirical observations found for the movies industry. There are very few studies related to UFS in relation to videogames, books or TV. This may reflect lower incidence of UFS, for example among video game players as suggested by Fukugawa (2011), but this requires more testing and replication. Only a fraction of the studies looks at observations of actual behavior, with almost no studies of actual behavior looking at moral and social sources of utility – again, a surprising finding given the way that costly anti-file sharing campaigns have been built on the premise that these matter.¹ Furthermore, there is an emphasis on cross sectional surveys that make attributions of causality extremely difficult. On the basis of the current evidence, we conclude that caution in drawing policy implications is warranted. More longitudinal work and more laboratory and field experimental work identifying causal links on behavior is needed. Section 7 contains our discussion and section 8 concludes.

¹ For example, in the U.K., advertising campaigns by the British Film Industry trying to create a moral link between unlawful downloading and theft.

2. Systematic and scoping reviews

Existing reviews on UFS are of the traditional narrative review type. This involves an expert in a particular field writing a narrative summary of the existing evidence. However there are a number of substantial limitations to this process. The first key problem is a substantial risk of bias. No matter how well intentioned review authors are, it is impossible to fully ameliorate the influence of prior beliefs and theoretical perspectives upon the selection and interpretation of relevant evidence (Hemingway and Brereton, 2009). The biases associated with narrative reviews include:

- A *preference bias*, which describes the propensity for authors to design an investigation so that their preferred outcome is likely to be found (Wilholt, 2009). For example, authors may omit poor quality studies that counter the authors proposed view, but include studies that support this view (Stanley, 2001).
- An *availability bias*, which refers to the ease with which associations are brought to mind being used as a heuristic to ascertain their likelihood (Shanteau, 1989, Tversky and Kahneman, 1973).
- *Cognitive dissonance*, referring to the discomfort that is felt when information inconsistent with what we already believe is presented (Festinger, 1957).
- *Selective exposure*, referring to seeking information congruent with what is already believed and avoiding contrary evidence to avoid cognitive dissonance (Hart et al., 2009, Wason, 1960).
- *Confirmation bias*, referring to the tendency both seek and misperceive or misremember incongruent information in a manner that supports prior beliefs (Oswald and Grosjean, 2004, Smith et al., 2008, Smith et al., 2007).

The likely introduction of these biases means that narrative reviews cannot be replicated, and their results cannot be independently verified (Hemingway and Brereton, 2009, Easley et al., 2000). This lack of independent verification is the second key problem for traditional narrative reviews. The methods by which particular studies are included or excluded and study results analyzed and amalgamated are not described. It is therefore impossible to determine whether studies were excluded because the author did not consider them relevant, because the study presented findings counter to their existing beliefs, or whether the authors were unaware the study existed.

The final problem with traditional reviews is a practical one. As the number of journals available as outlets for academic research increases, with many new journals catering to increasingly specific audiences (Goel and Faria, 2007), it can become increasingly difficult for any one expert to remain up to date with the entire literature available on any one topic (Gough et al., 2012). Therefore a reliance on an already existing corpus of accumulated literature can compound the issue of prior knowledge, with expert's collections likely to contain preferred literature.

The development of systematic reviews aims to address the weaknesses of the traditional narrative review. The aim is to produce an objective list of the most relevant and highest quality literature from a comprehensive list of primary sources in order to answer a specific research question (Higgins and Green, 2006, Akers et al., 2009). The procedures adopted enforce transparency and rigor via an explicit and reproducible method (Hemingway and Brereton, 2009). The processes by which literature is identified and included or else excluded in the review are made explicit, such that the influences of the prejudices of any single author are minimized.

In some circumstances a systematic review may not be appropriate or feasible. The procedures developed for systematic reviewing were primarily intended to confer the most definitive answers to hypotheses available based upon as complete as possible a body of literature as is available. This requires included studies to be sufficiently similar in terms of research question and methods adopted for hypothesis testing to be meaningful (Sharpe, 1997). The research questions posed in this investigation are broader; namely to determine the extent and nature of the research into the determinants and implications of UFS. Further, this study aims to offer an analytical reinterpretation and summation of the findings of the literature identified. The method most appropriate to meeting these aims are those adopted in scoping reviews (Levac et al., 2010).

Scoping reviews borrow the principles of systematic reviews in that the methods utilized throughout are transparent whilst maintaining as much rigor as is feasible given the broader study aims (Arksey and O'Malley, 2005). Therefore the search strategy, inclusion and exclusion criteria, and principles of charting and coding data are all specified as in any systematic review. However, unlike with a systematic review, the wider aims of the research impose practical constraints; thus the specific scope of the review as well as the inclusion criteria are refined iteratively during the data collection process as knowledge of the available evidence increases (Arksey and O'Malley, 2005, Levac et al., 2010), and the necessity to collect as far as feasible every available study on a topic is somewhat relaxed (Shemilt et al., In press). Instead scoping reviews aim to cover the conceptual breadth of the available literature and identify the different types of evidence that have been put forward to answer relevant research questions (Brunton et al., 2012). Thus, while systematic review searches are designed to be very specific, scoping review searches are extremely broad and generate a high degree of redundancy (Shemilt et al., In press). The identified literature is then charted or coded so that the variables and factors associated with UFS across a diverse array of literature can be meaningfully compared according to key issues or themes (Arksey and O'Malley, 2005, Levac et al., 2010, Thomas et al., 2012). The net result of this process is a largely narrative account of the current state of play in a research area allowing for identification of research gaps and, potentially, the generation of theory for future empirical testing (Arksey and O'Malley, 2005).

3. Scoping review: Methods

3.1 Identifying the research question and relevant literature

3.1.1 Determining the scope of the review

To determine the scope of the review, team meetings were held among the authors with additional input via consultations with experts in copyright from CREATE (<http://www.create.ac.uk/>). As a result of these meetings it was determined that the review should appraise the current state of research concerning the determinants and implications of UFS of digital media consumed for entertainment. This was initially defined as music, film, television, electronic games, and books.

3.1.2 Identifying relevant literature

In order to achieve study aims, a search strategy was developed that identified as broad as possible a collection of literature regarding UFS from English language academic and grey literature. Keywords were developed that combined a range of methods of sharing with relevant types of content that could be shared. Finally, additional keywords were excluded which introduced only irrelevant articles into the search. To ensure the search was comprehensive identified articles were checked against those from the reference lists of previous literature reviews (Hetrick et al., 2010). The reviews used for this purpose were “Ups and Downs” (Huygen et al., 2009), “Legal Economic and Cultural Aspects of File Sharing” (van Eijk et al., 2010), and “Copycats?: Digital Consumers in the Online Age” (Hunt et al., 2009). The search string was refined as required until identified results indicated that the included articles were as comprehensive as possible, i.e. the search prioritizes sensitivity over specificity (Brunton et al., 2012). The search strategy is summarized in Table 1. To ensure that the identified research encompassed a range of disciplines and perspectives the search string was utilized in five academic databases; Web of Knowledge, EconLit, Communication and Mass Media, PsychInfo, and LexisNexis.

Modes of sharing:
(File sharing OR file-sharing OR DRM OR Digital rights manag* OR digital medi* OR File upload* OR File download* OR Torrent file* OR peer-to-peer OR peer to peer OR p2p OR usenet OR freenet OR Newsgroup OR File transfer protocol OR ftp OR shared directory OR Piracy OR pirat* OR online piracy OR copywrit* OR intellectual property OR forum OR digital economy OR kazaa OR Limewire OR bittorrent OR Pirate Bay OR Napster OR isohunt OR eDonkey OR gnutella OR megaupload)
AND: Content shared

(video game OR video-game OR game OR gamer OR gaming OR electronic games OR digital game* OR digital music OR Music OR iTunes OR Album OR sound record* OR Music record* OR artist OR record sales OR DVD sales OR music purchas* OR DVD purchas* OR DVD OR film upload* OR film download* OR movie upload*OR movie download* OR motion picture* OR ebook OR e-book OR e book OR digital book* OR TV OR television OR tele vision OR tele-vision OR tele OR pornography OR porn OR xxx OR adult entertainment OR adult movie OR creativ* OR creator OR artist* OR entertain* OR attitude* OR intention OR social norm*)
NOT: Noise inducing keywords
(Medical OR medicine OR medieval OR Navy OR naval OR maritime)

Table 1. Search strategy for academic databases

Due to incompatibility with the full search string, a reduced search was also performed in the Westlaw database. The reduced string utilized for the Westlaw database was “(piracy OR file sharing) AND (music OR books OR video games OR film OR television OR pornography)”. To capture pre-publication articles, the database of working papers “Social Science Research Network” was searched for the past four years full years (2009-2013) using the keywords “file sharing” and “piracy”. Because this database does not support Boolean operators the two searches were run separately and the results combined manually.

Searches were performed and articles extracted from academic databases from the 20th to 27th of February 2013.

In addition to electronic database searching, grey literature was sought by searching the websites of key stakeholders and research centers which investigate UFS. Where research could not be identified or freely obtained the organizations were contacted and access to any research requested. The organizations from which grey literature was sought are listed in Table 2:

Organizations from which literature was sought
Intellectual Property Office (IPO)
Ofcom
The European Commission
Federal Trade Commission (FTC)
Consumer Focus
Organisation for Economic Co-operation and Development (OECD)
Performing Right Society for Music (PRS)
International Federation of the Phonographic Industry (IFPI)
UK Music
Federation Against Copyright Theft (FACT)
Creative Coalition Campaign (CCC)
Alliance for Intellectual Property
British Phonographic Industry (BPI)
Association for United Kingdom Interactive Entertainment (UKIE)
Institute for Information Law (IVIR)

Table 2. Attempted sources of grey literature

3.2 Relevance screening

One author (SJW) screened the titles of all identified articles. After excluding all obviously irrelevant articles two authors (SJW and PF) independently screened a randomly selected sample of 100 abstracts for inclusion. Articles were selected for screening via the random number generator in Excel and the results of the decision to include or not the selected articles were discussed between the two authors. This process helps to refine inclusion and exclusion criteria, and refine the scope of the proposed review. Further, this process helps to promote consistency in the screening process and limit the influence of single author bias.

Subsequently to this, all remaining abstracts were screened by a single author (SJW). Articles were retained for full text review where the abstract indicated that inclusion criteria may be met. Full text review was conducted by one author (SJW).

3.3 Inclusion and exclusion criteria

Unlike formal systematic reviews, scoping reviews develop inclusion and exclusion criteria iteratively during the process of screening articles (Arksey and O'Malley, 2005). During this process it became clear that, in addition to the entertainment media initially sought, it would be necessary to include unlawful acquisition of software not intended for entertainment use in order to fully explore motivations for UFS. Similarly, initially the review intended to cover the period from 1999 until the search date because this was the year in which UFS became a mainstream activity with the rise of Napster. However, this criterion was reconsidered at the full text screening stage due to an impractically high number of articles being retrieved. Therefore the scope of the review was narrowed to cover the last 10 years of UFS research in the period between January 2003 and February 2013.

The population was not limited at the start of the study but, in line with the body of research identified, this analysis will focus upon individuals that choose to download copyrighted materials from the internet. Those that upload or stream are not excluded but will not be the primary focus of analysis or discussion. Further, only the unlawful sharing of otherwise legal content is considered, i.e. studies exploring the distribution of materials such as child pornography are not considered within the remit of this report. Similarly, the report will focus upon the informal transfer of files between peers where no financial transaction takes place. Studies were included so long as at least some UFS behavior included takes place without a fee.

No limits were placed upon study design or quality. However, only studies which were empirical and based upon primary data were included. This limits the body of literature covered to a quality of evidence greater than opinion or anecdote (Mitton et al., 2009, Crooks et al., 2010). Similarly, the studies included were limited to those that included human participants. Papers that were exclusively models of behavior without testing of proposed models in a sample of humans were not included. Similarly, assessments of economic impacts of

UFS that only include modeling based upon estimated costs without any primary observation are not included. Finally, due to the wide range of literature identified and practical constraints, resources were not in place to translate foreign language reports. Therefore only reports published in the English language are included. Table 3 has a summary of inclusion and exclusion criteria

Inclusion Criteria
<i>To be included research must:</i> Explore the causes or consequences of UFS of digital media - Digital media is restricted to: Music, movies, software, TV shows, videogames, e-books, and pornography Be published after January 1 st 2003 inclusive Be published in the English language
Exclusion criteria
<i>Research is excluded where:</i> Media files are acquired via a financial transaction Media files contain illegal material (e.g. child pornography) No novel data is presented (e.g. reviews, opinion pieces, dual publications) No empirical testing on human participants is performed (e.g. pure economic models) The article is not written in the English language

Table 3: Summary of inclusion and exclusion criteria

3.4 Data extraction

Data was extracted from all articles using a standardized Excel spread sheet by one of two reviewers (SJW or HM). The data extraction form was developed iteratively via the collaboration of two reviewers (SJW and EP) during the extraction of the first 17 articles. This process helps to standardize procedures and the coding of data. Data extracted included generic identification and descriptive data (e.g. author names, year of publication), any declared source of funding, stated study aims, media included in study, a summary of methods, population variables (sample size, number of males, description of participants, participants occupation, and average age), factors and outcomes included in study, a summary of results on a per variable basis (including direction and significance of any identified effect) and a summary of the overall study findings. Identified factors and outcomes were coded according to a framework developed during data extraction. It is not possible to predict or categorize a priori all possible variables that could be identified in a scoping review and so categorization of variables had to be an iterative process.

3.5 Outcome measure

The intention of a scoping review is to characterize the current research available in a broad topic area (Shemilt et al., In press). Further, the wide range and type of evidence synthesized makes formal approaches to assessing the risk of bias from included studies recommended for systematic reviews, such as the Cochrane risk of bias tool (Higgins et al., 2011), inappropriate for scoping reviews (Arksey and O'Malley, 2005).

Moreover, the many available tools for assessing study quality are often scored according to arbitrary criteria and their use can result in misleading statements regarding the quality of evidence available (Greenland, 1994, Juni et al., 1999). Therefore, instead of a rating for study quality, the type of evidence available is characterized in terms of the *distance of the unit of measurement from actual behavior*, which is what ultimately we are interested in when considering UFS and its welfare implications. We hesitate to do this for *qualitative research*, as this can examine reports of stated behavior and preferences in a holistic manner and so is not considered a lesser form of evidence but separate from the rest of the hierarchy. It is more straightforward, however, to consider the distance from actual behavior when looking at other sources of quantitative evidence.

Starting from the most distant from actual behavior, we have *stated preferences and attitudes* on how good or bad, right or wrong, an action is perceived to be, and *stated intentions to perform behavior*, i.e. to engage in UFS behavior. Closer to – though still not quite - actual behavior are *willingness to pay (WTP)* measuring the amount of money that people state they are willing to pay to obtain a good and *stated behavior*, which is a participant’s report of behavior that has occurred in the past, typically as stated in a survey. We classify a study as looking at *observed behavior* if it is behavior directly observed either at an individual or population level: behavioral experimental data and sales data fit into this category. Table 4 summarizes the hierarchy of outcome measures. Depending on where the mix of available evidence lies in terms of the hierarchy, we can evaluate whether the empirical evidence and associated policy implications are comparatively stronger or weaker.

Outcome Measure	Definition
<i>Qualitative research</i>	Explorations of perceptions of or engagement in behaviors without quantitative assessment.
<i>Stated preferences and attitudes</i>	Outcome is at the level of how good or bad, right or wrong, or preferable an action is perceived to be
<i>Intentions to perform behavior</i>	Outcome described participants reports of behavior that they plan to engage in in the future
<i>Willingness to pay (WTP)</i>	Outcome represents the amount of money that a participant states they are willing to pay in order to obtain a good
<i>Stated behavior</i>	Outcome represents a participant’s report of behavior that has been engaged in in the past, such as from a survey
<i>Observed behavior</i>	Outcome represents behavior that is either directly observed at the level of the individual, such as in an experiment, or else at the population level, such as from sales data

Table 4. Definition of outcome measures for unlawful file sharing

3.6 Data analysis

Data were analyzed using thematic framework analysis (Ritchie and Spencer, 1994, Ritchie et al., 2003, Thomas et al., 2012). Data were initially coded during extraction according to relatively *ad hoc* groups of similar variables. These groupings and variables were discussed during regular research team meetings. Discussion of the data as it emerged led to the development and refinement of a framework in which the proposed correlates of UFS could be incorporated. Each identified variable was combined with similar variables from different studies and housed within the developing framework. Where variables failed to fit within a theme, either the variable was moved to a more fitting theme, or else the theme was modified to account for the data (Rabiee, 2004). This process was facilitated by the use of a spread-sheet for coding, as it allowed the easy cutting and pasting of variables between themes as required. The individual results within each subtheme were then divided according to level of outcome measurement, and medium type (music, movies, TV, videogames, software, books or pornography). This allows for the comparison of the relative impacts of variables across different measures of outcome and in different media. Given the extensive nature of the scoping review it is not practical to present all findings. Instead only a summary of the key points from each theme are presented. Full tables of themes and the variables contained within along with references for these, and the original extraction form, are available as an online supplement.

3.7 Selection of studies

A total of 54319 articles were identified via electronic databases, with an additional 122 potentially relevant reports identified via the grey literature, for a total of 54,441 initial sources. As is common when searches are designed to be highly sensitive (Brunton et al., 2012), a large majority of these studies were excluded. Figure 1 summarizes the inclusion and exclusion process for all articles identified through electronic databases. Of the 329 articles subjected to full text review, 134 were excluded. The reasons for exclusion were not being relevant (43), being a duplicated or dual publication (37), not being an empirical study (36), only modeling data with no testing with human participants (10), only examining exchanges of media which included a financial transfer (7), and one study was excluded for being in a foreign language. This left 195 articles to be included in the review.²

Regarding the 122 reports identified from the grey literature, 108 were excluded. The reasons for exclusion were not being empirical articles (44), not being relevant (43), being a duplicate publication of an already identified article (13), only modeling behavior without empirical testing (4), only examining exchanges of

² Three studies that had data extracted did not provide data that could be synthesized into any of the categories of our conceptual framework below and so were not used further. These three studies were not used because they only compared UFS attitudes and behavior depending upon occupation (Mishra et al., 2007), provide a typology of those that UFS but without presenting sufficient information for the individual factors that determined this typology to be extracted and combined with similar studies (Molteni and Ordanini, 2003), or else provided insufficient description of the variables included in their model to permit accurate classification of included factors (Peukert and Claussen, 2012).

media which included a financial transfer (2), and being published in a foreign language (2). This left an additional 14 articles that were included in the review. In total this meant that data was extracted from 209 articles. Of these 209 articles, 33 provided evidence for the welfare implications of UFS. There were 186 articles which were used to contribute evidence for the proposed conceptual of UFS. A further 53 studies provided evidence for moderators of UFS behavior. Finally 70 studies provided information regarding the impact of demographic factors upon UFS. Therefore the final number of studies included in the review is 206. Only one article made any reference to pornography as a media (Mateus and Peha, 2008), and in this case no predictors of unlawful pornography downloading were identified. Therefore this media was not analyzed further.

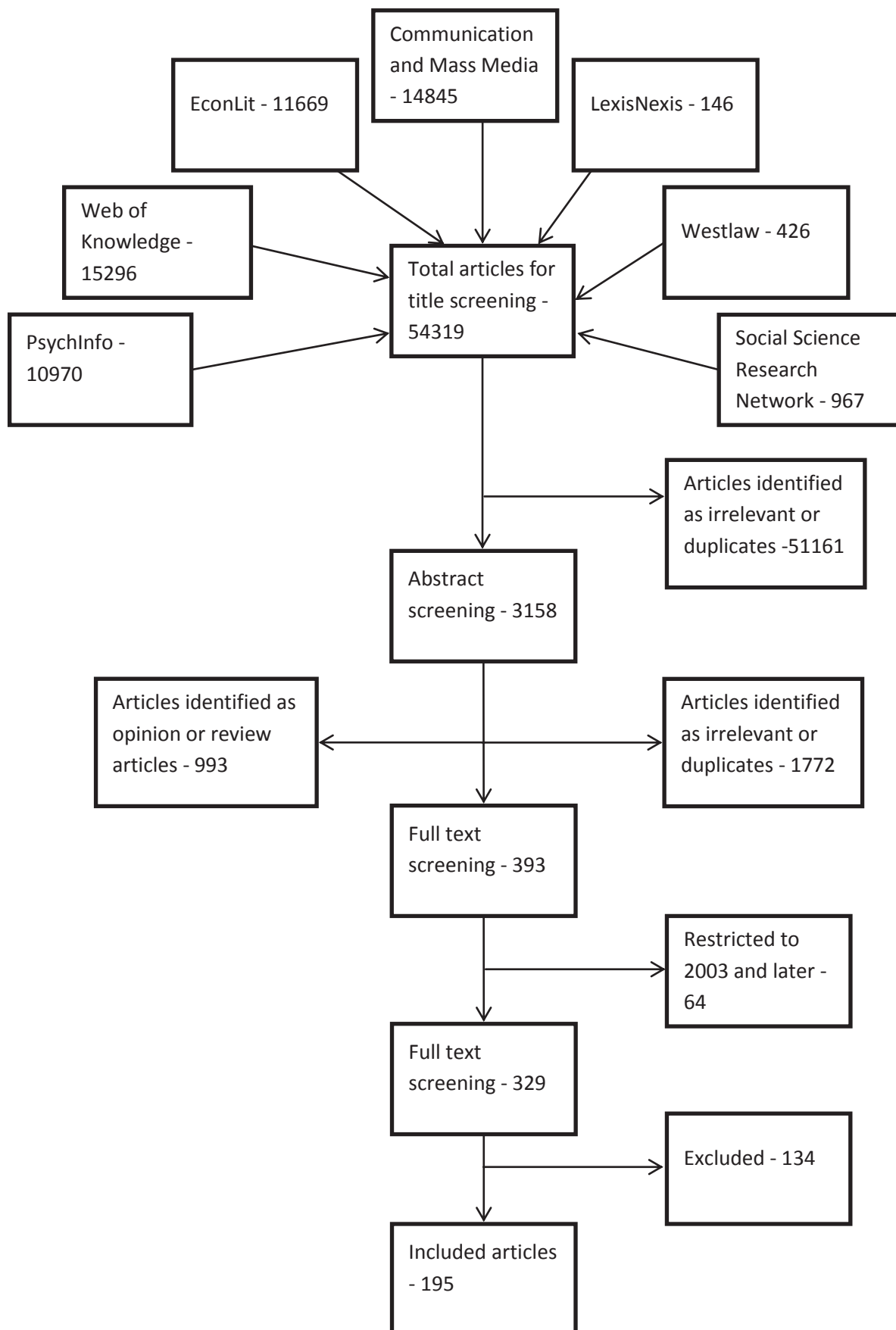


Figure 1. Flow diagram of academic articles included in the review (in addition to 14 grey literature articles)

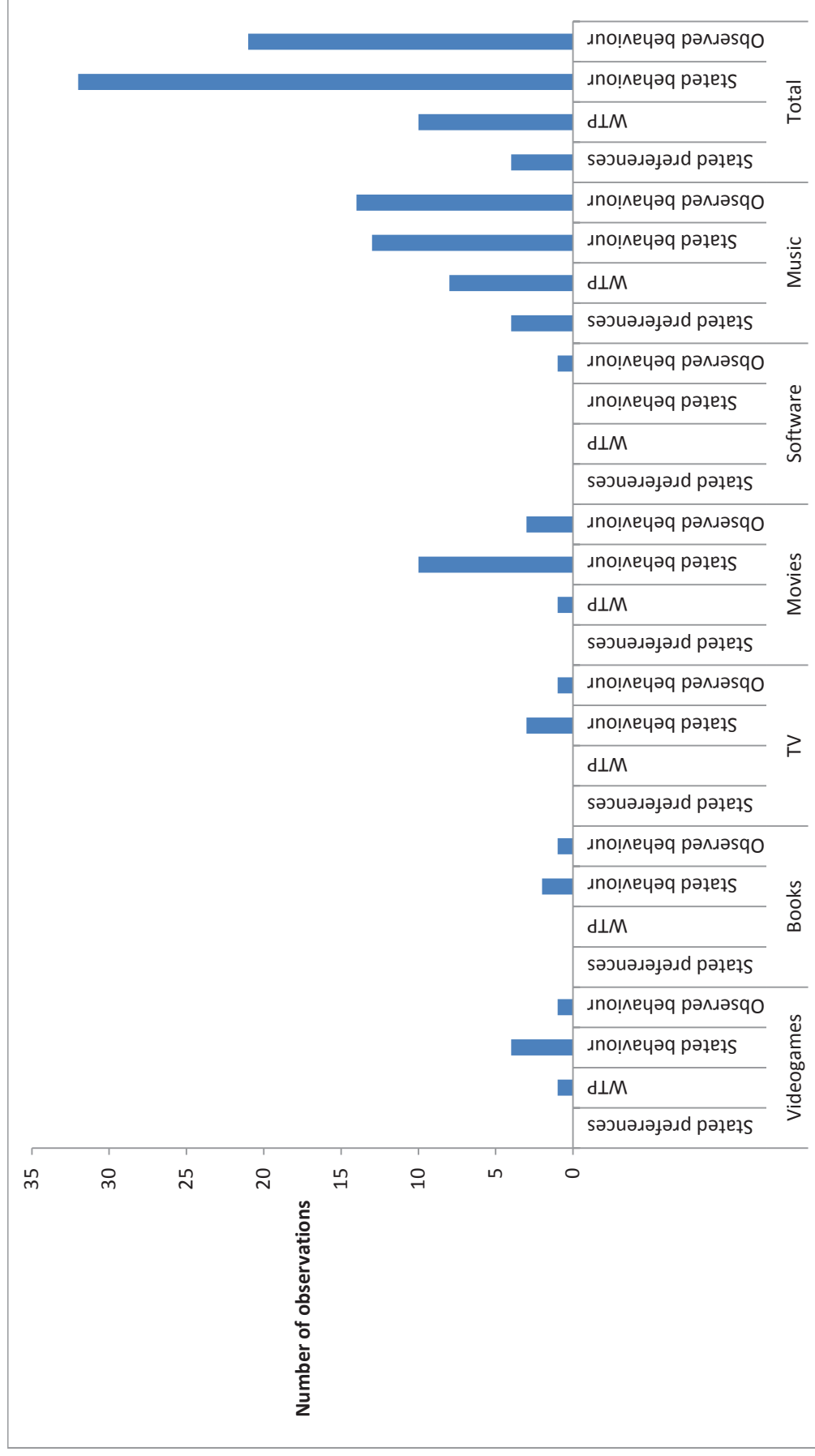


Figure 2. Number of observations at each level of outcome measurement between media for estimates of the impact of unlawful file sharing

4. Consequences of unlawful file sharing for welfare

Figure 2 illustrates the extent and type of evidence included in the review to evaluate the consequences of UFS for welfare. We define welfare in standard microeconomic terms in terms of the sum of consumer and producer surplus: that is, the extent to which a given consumption of lawful and unlawful files benefits consumers and producers net of costs. Consumer surplus is equivalent to the willingness to pay (WTP) by consumers consuming the files net of costs. Producer surplus is equivalent to the revenue from lawful consumption net of costs. Producer surplus corresponds just to a transfer from consumer surplus, and so a decrease in producer surplus has simply a redistributive effect from producers to consumers but no welfare implications overall. Of course, in a dynamic setting, it is possible that reducing producer surplus may lead to insufficient incentives to producers to create and commercialize their work, i.e. there may be dynamic effects that in turn may affect welfare.

Our scoping review focuses on evidence. Evidence for positive or negative effects of effects of UFS is heavily skewed towards music, with fewer studies looking at movies, videogames, TV, books or software. Most studies seeking to answer this question did try to estimate the impact of UFS upon behavior, with most studies investigating the impact of stated UFS upon stated legal purchases and fewer attempting to directly observe behavior. This data is also presented in Table 5.

Answering the question of what the UFS implications are for welfare obviously depends on how welfare is measured. Two approaches have been followed by different parts of the empirical evidence in our studies set. An approach has been to look at the effect of UFS on sales in a given market, and so with a focus on producer surplus. The other, less common, approach has been to use WTP measures as an estimate of consumer welfare, and so with a focus on consumer surplus.

Medium	Stated preferences	WTP	Stated behavior	Observed behavior	Total
Videogames	0	1	4	1	6
Books	0	0	2	1	3
TV	0	0	3	1	4
Movies	0	1	10	3	14
Software	0	0	0	1	1
Music	4	8	13	14	39
Total	4	10	32	21	67

Table 5. Number of observations at each level of outcome measurement between media for estimates of the impact of unlawful file sharing

Impact on sales. A summary of the individual studies estimating the impact of UFS upon sales is presented in Table 6. The two primary methods for assessing any impact of UFS upon sales was to either directly ask participants about their UFS and estimate the extent to which this was associated

with reported legal sales, or else to obtain a measure of legal sales and estimate UFS rates and seek a correlation between these variables. Unfortunately, the overall impacts of UFS upon legal sales cannot be accurately discerned from the current literature using either method. UFS and legal purchasing appear to be highly correlated, with five large representative samples from three nations finding that participants that downloaded the most unlawful material also purchased the most legal material (van Eijk et al., 2010, Huygen et al., 2009, Poort and Leenheer, 2012, Ofcom, 2012, Filiciak et al., 2012). One explanation for this finding is that while unlawfully shared files are replacing legal sales in those that would have otherwise purchased media, both UFS and legal purchases are correlated with an unobserved variable such as interest in a particular media. Alternatively, it is possible that unlawful files are increasing demand and generating sales in those that would not have purchased media had they not been exposed to it via unlawful networks. There is some evidence that both effects exist, and the extent to which UFS is harmful is determined by which of them is dominant within a population (Bounie et al., 2007, Andersen and Frenz, 2010).

First author	Year	Unlawful file sharing measure	Direction of effect	Result summary
<i>Stated behavior</i>				
<i>Music</i>				
Andersen	2010	Canadian survey	No overall effect	p2p file sharing reduces CD purchases for a subgroup of the population but stimulates it in others with a net result of no significant impact upon sales
Balducci	2009	Student survey	Lowered digital sales	Use of p2p services was associated with purchasing fewer mp3 albums, and may be associated with purchasing fewer CDs ($p < 0.1$)
Barker	2012	Re-analysis of Andersen 2010	Lowered CD sales	Barker re-analyzed Andersen's 2010 study and by removing statistical corrections to weight the sample for the Canadian population and including participants that had ceased to purchase CDs in 2005 re-analysis indicated that a 10% increase in number of files downloaded is associated with a 0.43% decrease in music purchases
Barker	2012	Re-analysis of Andersen 2010	Lowered CD sales	Using data from Andersen's (2010) study regarding how much music participants would purchase if unlawful file sharing was not an option, estimated that an average downloader would spend \$179 more on music per year for a total loss to industry of \$1.1 Billion. Authors note that this seems unrealistically high.
Bounie	2007	Student survey	Lowered overall CD	p2p sharing reduces music purchases for a subgroup of the population but stimulates it

			sales	in others with an overall negative effect upon sales
Peitz	2004	US survey	Lowered CD sales	Estimated an approximate 2% loss in CD sales due to unlawful internet file sharing.
Rob	2006	Student survey	Lowered CD sales	Estimated that for every five items downloaded, one sale is lost.
Tanaka	2004	Student survey	Increased CD sales	Using p2p serviced was associated with purchasing more CDs
Zentner	2006	Survey of seven European nations	No effect on CD sales	Downloading MP3's had no significant effect upon sales. Additional analyses implied a possible reduction in sales up to approximately 8%.
<i>Movies</i>				
Bai	2012	Student survey	Lowered sales	Unpaid movie consumption lowered sales, but only to a small degree with 15 unpaid viewing required to displace a single paid viewing.
Bounie	2006	University student and staff survey	No effect on theatre or rental sales. Possible reduction in video sales.	There was no significant negative effect of the intensity of unlawful file sharing on theatre attendance or rentals. The frequency of unlawful file sharing has a negative and significant effect on the probability to purchase a video, but for users that purchased any videos then unlawful file sharing had no effect on the number of videos purchased.
Frank N. Magid Associates	2009	US sample of "Vuze" users	Increased sales	Study noted that users of a particular file sharing service spend above average on media in terms of cinema visits, rentals, and DVD purchases.
Hennig-Thurau	2007	Prospective survey of German consumers	Lowered theatre sales, no effect on renting, positive effect on DVD sales	Downloading had no effect upon theatre sales unless a film had been downloaded and watched. No effect of downloading on renting and a possible positive effect upon DVD sales. However, intent to download had negative effects on all types of sales.
Rob	2007	Student survey	Lowered sales	Unpaid viewing reduced later paid viewing by about 24%, however the overall unlawful file sharing rate was low (5.2%)
<i>TV</i>				
Waldfoegel	2009	Student survey	Mixed effects	Watching authorized and unauthorized TV shows on the internet increased "sometimes" watching TV but reduced "frequent" TV watching. Legal availability via internet may have offset potential damage from unlawful file sharing, and much unlawful watching may be to catch up on missed episodes.
<i>Videogames</i>				
Fukugawa	2011	Japanese survey	No effect on sales	Direct correlation finds a positive effect of downloading on purchases, but use of an instrumental variable for unlawful file

sharing (internet knowledge) finds no effect upon sales.

<i>Mixed media</i>				
Filiciak	2012	Polish survey	Positive correlation with sales	Participants that used “informal distributions” also purchased in 24% of cases while of those that did not use obtain content informally purchased in only 7% of cases.
Huygen	2009	Dutch survey	Positive correlation with sales	Unlawful sharers of content are more likely to purchase goods such as DVDs, games, and CDs as well as buy complementary goods such as concert tickets and merchandise
Poort	2012	Dutch survey	Positive correlation with sales	Unlawful sharers of content are more likely to purchase goods such as DVDs, games, and complementary goods such as concert tickets and merchandise
Van Eijk	2010	Dutch survey	No effect on sales	File sharers buy music and films with the same frequency as non-file sharers and buy more games, concert tickets, and music merchandise.

<i>Observed behavior</i>				
<i>Music</i>				
Aguiar	2013	Clicks on legal and unlawful content providers	Increased digital sales	Controlling for legal streaming and interest in media and music, unlawful downloads have a significant positive effect upon digital music sales by increasing sales by approximately 2%.
Bhattacharjee	2006	Availability of unlawful files on WinMX, and chart survival	Positive correlation with chart survival	Higher sharing activity in earlier weeks predicts better chart positions and CD chart survival in later weeks.
Bhattacharjee	2007	Availability of unlawful files on WinMX, and chart survival	Mixed effects	Unlawful file sharing may have positive impacts upon CD chart survival for the most popular music with high debut ranks, but a negative impact upon lower ranked songs. Overall chart survival was lower when unlawful file sharing activity was higher.
Blackburn	2005	Files available for unlawful file sharing on 5 main torrent sites, and Nielsen Soundscan sales data	Mixed effects	Unlawful file sharing was found to increase CD sales for small artists and decrease sales for more famous artists with an overall reduction in sales
Hammond	2013	File availability on an unnamed file sharing site and Nielsen Soundscan sales data	Mixed effects	Unlawful file sharing and CD sales are positively correlated for most artists, but not those on independent labels indicating unlawful file sharing is more harmful for smaller artists.
McKenzie	2009	Availability of unlawful files on Limewire, and sales ranks from Australian Record Industry	Digital sales lowered	Availability of an unlawful file was associated with lower chart positions for digital sales but had no relationship with physical sales

Oberholzer-Gee	2007	Association Unlawful downloads tracked via OpenNap servers and then used German schoolchildren on vacation as a proxy for unlawful file availability. Used Nielsen Soundscan sales data	No effect on CD sales	No significant effect on sales, with estimates ranging from unlawful file sharing accounting for between 6.5 million lost album sales and 8.9 million additional sales.
Pons	2006	Proportion of population in 60 nations that are p2p users and legal demand for CDs in those nations	No effect on CD sales	No effect on sales when use of p2p users was utilized as a measure of unlawful sharing. This study also uses broadband penetration as a proxy for unlawful file sharing which did find a relationship with lowered sales.
Tanaka	2004	File availability on Winny file sharing site and Original Confidence sales data	Positive effect on CD sales	p2p downloads are positively associated with CD sales.
Zentner	2005	Movement from traditional to digital piracy in a nation and music sales data from IFPI for 71 countries	No effect on CD sales	There was no effect of nations moving from traditional to digital piracy upon legal music sales
Zentner	2009	Unlawful software file sharing rates and sales data from IFPI for 49 countries	Lowered physical sales	Unlawful software file sharing did not have a significant negative association with total music sales but did have a significant negative association with physical music sales.
<i>Movies</i>				
Zentner	2010	Unlawful software file sharing rates and sales data from the European Audiovisual Laboratory and International Video Federation	No effect on sales	Unlawful software file sharing was not related to theatre sales, DVD and VHS sales, or rentals.
<i>Mixed media</i>				
Adermon	2011	Internet traffic compared before and after introduction of a new law in Sweden as compared to Norway (no new law). Sales data from IFPI, GfK, Swedish film Institute, and Kino	Lowered music sales, no effect on movie sales.	Physical music sales increased by 26.5% in the 6 months following the introduction of the law, but after this period gains were not significantly different to zero. Digital music sales increased by 48.4% in the 6 months after the law was introduced, and the gains remained significant until the end of the year. Theatre and DVD sales were not significantly affected by the introduction of the new law.
Mateus	2011	File sharing rates	No	Study assumes harm is caused by unlawful

estimated from OpenBitTorrent and PublicBT. Study assumes a negative impact of file sharing of between 5% to 30%	estimate of effect size	file sharing. Estimates range from \$7 billion and \$40 billion for the music industry, and \$12 billion and \$74 billion for the movie industry.
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Table 6. Summary of studies on estimating the impact of unlawful file sharing upon sales

The extent to which UFS is found to be harmful for legal sales is heavily dependent upon how data are modeled. For example, Andersen and Frenz (2010) surveyed a stratified sample of Canadian CD purchasers and identified that there was overall no significant negative effect of UFS on CD purchasers because, while there was a subgroup of the population for whom UFS replaced sales, there was another subgroup for whom sales were stimulated with the two groups cancelling each other out. However, Barker and Maloney (2012) re-examined the same data and included participants that had been excluded in the original analyses for not purchasing CDs after 2005, and removed statistical weighting of the sample to correct for population values in Canada. Re-analyzing the data under these new conditions found that a 10% increase in UFS reduced CD sales by approximately 0.4%. Thus, even on the same data, the presence or otherwise of any effect of UFS depends upon the measures utilized by particular authors; and with no consensus over what are or are not appropriate controls, resolving the question of whether UFS is harmful or not may remain more a matter of opinion than fact.

To give a second example, both Blackburn (2005) and Hammond (2012) estimated number of files downloaded from UFS sites and compared these to sales data from Nielsen SoundScan. However, while Blackburn found that UFS increased sales for minor artists and reduced sales for major artists for an overall reduction in total sales, Hammond found the opposite, with larger artists benefiting from UFS at the expense of smaller artists for an overall net increase in sales. The difference is plausibly caused by Blackburn measuring the popularity of an artist based upon chart positions over the last decade and by Hammond instead making estimates based upon whether or not artists were signed to major record labels or not. That the choice of variables selected reversed the conclusions that were drawn from the studies warns against attributing a high level of confidence in any single study.

A second method for estimating the impact of UFS on legal sales is to utilize instrumental variables. This approach requires identifying a variable that has an effect upon legal sales only via its relationship with UFS. In other words, the variable increases or decreases UFS but is not itself causally related to legal sales. For example, Oberholzer-Gee and Strumpf (2007) found that, when German schoolchildren are on holiday, then the availability of unlawful files increases thus causing an increase in unlawful downloading in the USA. However, no effect of German schoolchildren being on

holiday was found upon legal sales in the USA. Once again, however, the choice of instrumental variable can have a significant impact upon conclusions and it is not clear that the choice is always appropriate. For example, a number of studies (e.g., Zentner, 2009, 2010) used internet or broadband penetration as a proxy for UFS. This variable may be more convincingly conceptualized as a facilitating factor for UFS rather than as an actual measure of UFS. Furthermore, no instrumental variable yet utilized has received widespread acceptance from all sides of the UFS debate. For example the use of German school children on holiday as an instrument for UFS has been robustly criticized for indicating that US UFS is unrealistically strongly associated with the number of German school children at school (Liebowitz, 2010).

The type of sale measured may also change the estimate of impact. For example Balducci (2009) found stronger evidence that UFS reduced digital music sales than that it reduced physical CD sales, and most studies focus upon the impact of UFS on physical media sales. There may also be cultural differences in the impacts of UFS. Rob and Waldfogel (2007) found that the movie UFS rate was very low in US undergraduate students at 5.3%, but that when UFS was engaged in the probability of then paying for a movie was reduced by over 20%. In contrast, Bai and Waldfogel (2012) repeated this analysis in a sample of Chinese consumers and found a much higher UFS rate of approximately three quarters of movie consumption being unpaid for in China, but the rate at which unpaid viewing displaced paid for viewing was much lower at about 6.7%. This difference in effect was attributed to a long history of unlawful distribution in China implying that new forms of distribution (UFS) would mostly replace old forms of distribution (black markets), while in the US the opportunity to unlawfully file share media would represent a new opportunity for consumers with predominantly legal sales to be replaced via online UFS.

One problem with all studies using an impact on sales approach is the neglect of the consumer side in evaluating welfare.

Impact on WTP. In contrast to the larger number of studies taking the sales approach, somewhat surprisingly only four studies have explored the welfare implications of UFS via the WTP approach. However, the studies estimating impact of UFS on welfare using willingness to pay measures have been unanimous in finding a net societal benefit. The first study to estimate this effect was Rob and Waldfogel (2006) who estimated that in the absence of UFS university students said they would pay \$25 more on music per year (\$126 versus \$101). Due to their greater exposure to music, consumer welfare was increased by \$70 worth of music, with \$45 of that increased welfare coming from the music that would otherwise not have been purchased. Waldfogel (2010) similarly estimated that, in a sample of economics students, UFS reduced the revenue paid to the music industry by between \$1.00 and \$1.86 but provided access to between \$8.50 and \$10.91 worth of music that would otherwise not have been purchased to consumers. van Eijk et al. (2010) surveyed a representative sample of the

Dutch population, and despite the change in sample type found a similar result. UFS was estimated to cost the music industry €100 million per year whilst providing €200 million worth of music that would otherwise not be purchased to the consumer. However the rate at which legal sales were displaced by files that were unlawfully acquired for this estimate was based upon that calculated by Rob and Waldfogel (2006) and so it is unclear how generalizable this estimate based upon US undergraduate students would be to Dutch music buyers. A final study by Sinha et al. (2010) was specific to the impact upon welfare caused by digital rights management (DRM) and found that providing music tracks without DRM both increased welfare and revenues for industry when students were asked how much they would be willing to pay for songs with more or fewer restrictions on use. In none of the above studies were calculated WTP estimates incentivized, in as much as participants were not required to actually forgo any resources in order to obtain media as part of the studies.

Overall, both approaches so far have clear limitations. The sales approach neglects the demand (consumer) side by mostly focusing on legal sales and suffers from severe identification problems in using sales data, for which there have been a number of solutions leading to opposite conclusions. The WTP approach works on the assumption that primarily relying on the demand (consumer) data is a good approximation, but this data is unincentivized and conceivably likely to lead to consumer evaluations that are upwardly biased; it may also be sensitive to the sample used. Moreover the number of studies adopting the WTP approach is insufficient to draw firm conclusions. Furthermore, both approaches are static, in that they do not try to estimate the long-term implications that having a market with strong property rights or conversely with business models based on more open access would have on welfare; these too would have to be factored into any welfare analysis.

5. Unlawful Downloading: A Conceptual Framework

We model the consumer decision whether to obtain an unlawful copy z , do nothing or purchase a legal copy v of the product by considering different potential sources of utilities and disutilities of a legal product or an unlawful copy. We consider legal and financial sources f , experiential sources x , technical sources t , social sources s and moral sources m . f refers to expected legal and financial gains and losses, and associated risks. x refers to the utilities and disutilities connected to experiencing a copy (legal or unlawful) of the product. t refers to the perceived technical difficulty, and associated risks, connected to getting hold (e.g. by downloading) of a legal or unlawful copy. s refers to the factors associated with the psychological influence that others can have, e.g. via affecting self-image. m refers to the moral judgments associated to downloading unlawful vs. legal copies and to how mismatches between judgments and behavior are managed. Table 7 presents these different sources of utilities and disutilities in more detail.

Define an index i to identify any of the sources (f, x, t, s, m). Let g_{iz} and g_{iv} be the expected utility gains in relation to source i from an unlawful copy z and from a legal copy v , respectively. We assume $g_{iz}, g_{iv} \geq 0$. Let l_{iz} and l_{iv} be the expected utility losses in relation to source i from z and v , respectively. We assume $l_{iz}, l_{iv} \geq 0$. Note that we are allowing both gains and losses to be equal to 0 in relation to any given source.

Let r_{iz} and r_{iv} be the risk premium in relation to source i from z and v , respectively. The risk premium is how much the consumer would need to be compensated for in order to avoid the risk associated with a given source, e.g. the technical uncertainty from an unlawful copy. If consumers are risk neutral – that is they do not care about riskiness –, $r_{iz}, r_{iv} = 0$. If they are risk loving, we would have $r_{iz}, r_{iv} < 0$, that is consumers would be willing to pay in order to face the risk (in the same way in which they may, for example, be willing to pay for a lottery ticket). The usual assumption would however be that consumers are risk averse, in which case $r_{iz}, r_{iv} > 0$. Note that we allow risk attitude to be context sensitive, i.e. to be dependent on the source. While the assumption of risk aversion may be plausible for financial and legal utility, experiential utility and technical utility, it is less clear that this is necessarily the case for social utility and moral utility.

For any i , we can then define the net utility u_i from an unlawful copy z as $u_{iz} = g_{iz} - l_{iz} - r_{iz}$, and from a legal copy v as $u_{iv} = g_{iv} - l_{iv} - r_{iv}$. The total net utility from an unlawful copy U_z and from a legal copy U_v are a function of the net utilities from the different sources:

$$(1) \quad U_z = k(u_{fz}, u_{xz}, u_{tz}, u_{sz}, u_{mz})$$

$$(2) \quad U_v = k(u_{fv}, u_{xv}, u_{tv}, u_{sv}, u_{mv})$$

where, for any i , we assume $\partial U_z / \partial u_{iz} > 0$ and $\partial U_v / \partial u_{iv} > 0$, that is total net utilities are increasing in the individual sources of net utilities.

The consumer will choose the unlawful copy if $U_z > U_v$ and if $U_z > 0$. The consumer will purchase the legal copy if $U_v \geq U_z$ and if $U_v > 0$.³ The consumer will do nothing if there is not a net total positive utility gain from either option, i.e. if $U_z, U_v \leq 0$. Figure 3 summarizes the decision making process of the consumer as a flow chart.

Utility	Definition
Total net utility	Overall assessments regarding how beneficial a behavior is (e.g. attitudes

³ For simplicity we assume that, if the consumer is indifferent between obtaining a legal copy and an unlawful one but would like to buy one of the two (that is, if $U_z = U_v > 0$), the consumer buys the legal copy. Alternatively, one could assume that the consumer chooses whether to buy a legal or an unlawful copy at random in this limit case.

	or the results of a cost-benefit analysis), or a reported intent to engage in a behavior in future
Legal and financial net utility	Factors associated with financial outlay for legal produce as well as the perceived likelihood and legal and financial consequences of detection whilst engaged in unlawful activity, such as monetary fines
Experiential net utility	Factors associated with perceptions of goods themselves such as individuals' interest in a media type or a desire to experience goods
Technical net utility	Factors associated with individuals' perceived or actual ability to unlawfully file share, for example their technical skill or the availability of broadband connections
Social net utility	Factors associated with the influence others can have upon the behavior of an individual. For example, whether or not peers engage in unlawful file sharing or perceive the behavior to be acceptable or not
Moral net utility	Factors associated with how right or wrong unlawful file sharing is perceived to be by an individual, and how mismatches between individuals moral beliefs and their actual behaviors behavior are managed

Table 7. Definitions of utilities included in the proposed research model

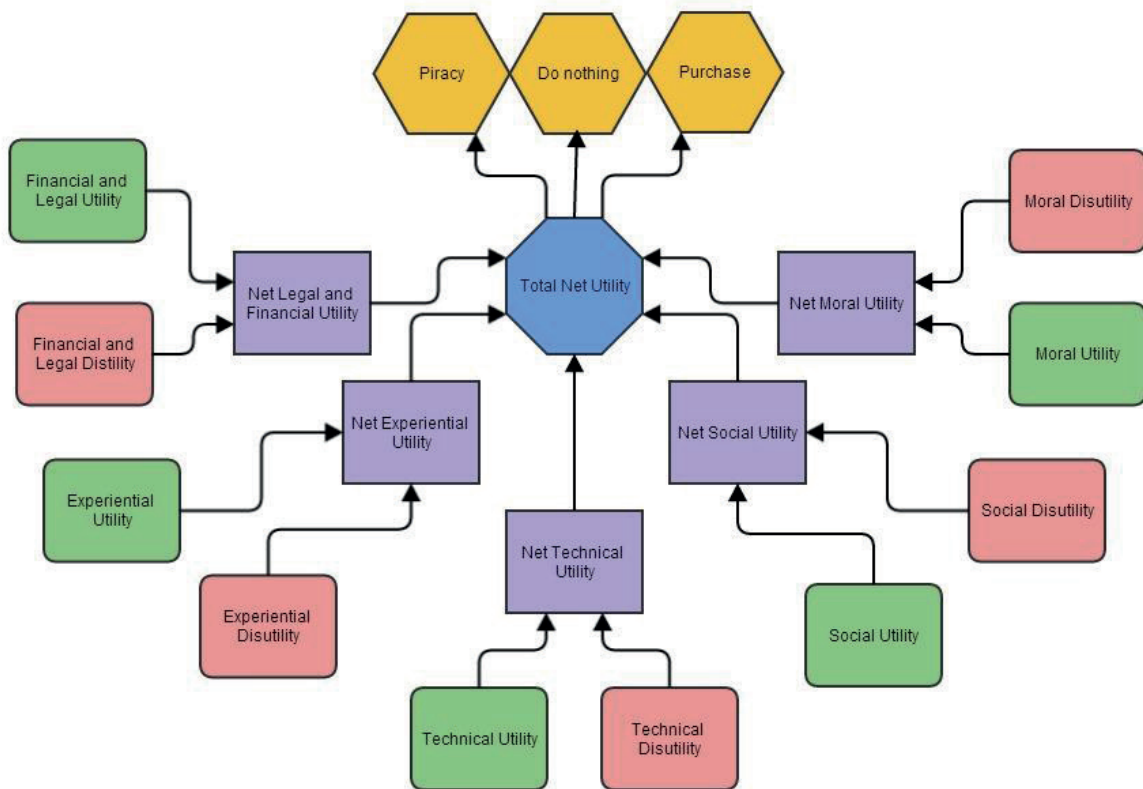


Figure 3. Proposed model of unlawful file sharing decision making.

We can classify data from 186 of the 206 included studies from our scoping review according to the net utility source. Some studies (also) refer to total net utility estimates regarding how beneficial or otherwise UFS is perceived to be when compared to the options of legal purchase or no action; these studies we classify as providing information on total net utility.

We can now provide a conceptual representation of the available literature along three dimensions: (1) the net utility source or total net utility, as discussed; (2) the market medium (music, software, movies, TV, books and videogames); and (3) the outcome measure (as presented in section 3.5: qualitative, stated preferences, intentions, willingness to pay WTP, stated behavior, observed behavior). We illustrate this in Figure 4 and in Table 8.⁴

By looking at the cubic space of Figure 4 and Table 8, it is obvious that books, videogames, and TV have received very little attention in the literature. There is some literature represented that explores software and movie UFS, but by far the most common medium explored is music. A number also ask participants to report on “digital piracy”, “p2p use” or “downloading of digital media” generally. This approach is especially common when exploring net utility estimates. The reliance on a generic description of behavior seems likely to generate measurement error. To demonstrate an association between a proposed cause of a behavior and the behavior itself it is very important to be very specific about what the target behavior is. Motives to download music unlawfully may differ from motives to download movies or software. Thus asking participants for reasons they download media in general leaves both participants and researchers unable to specify which behaviors are being considered and thus introduces noise into estimates of association. Furthermore, estimates of behavior based upon actual observation are rare when compared to outcomes based upon perceptions of UFS, stated intentions to file share or purchase, or stated behaviors. Almost all of the studies of observed behavior concern financial and legal net utility and technical net utility, and even in these cases are mostly restricted to music and movies. Most of the observations are simply looking at attitudes (stated preferences) and intentions, and it is unclear whether these would result in actual behavior, or indeed, where there is a relationship, whether they may reflect reverse causality (from behavior to statements made congruent to the behavior).

We now consider the state of the evidence with respect to total net utility and each net utility source in more detail; the literature has also looked at various moderating variables and demographic factors and we shall consider them briefly afterwards.

⁴ Individual studies may be counted in multiple cells, e.g. a single study may cover both music and movies.

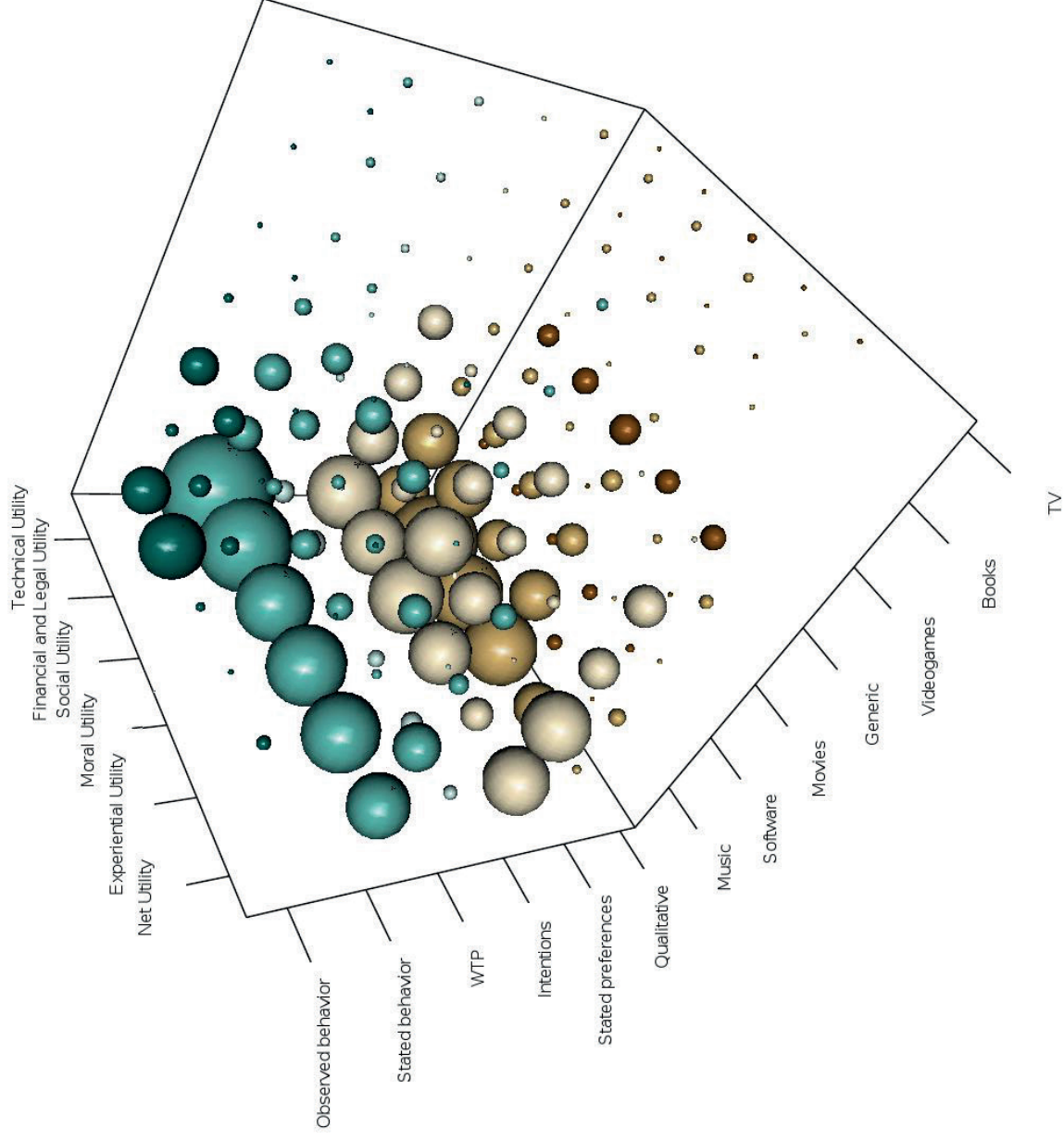


Figure 4. A Cubic Space of Available Evidence on Unlawful File Sharing

Note: the size of the sphere in the cube represents the amount of evidence available for each combination.

Utility	Medium	Qualitative	Stated preferences	Intentions	WTP	Stated behavior	Observed behavior	Total
Financial and Legal Utility	Videogames	0	1	0	0	2	1	4
	Books	1	2	0	0	0	0	3
	TV	1	2	0	0	0	1	4
	Movies	0	7	3	0	7	7	24
	Software	3	16	7	1	4	5	36
	Music	3	26	18	7	24	16	94
	Generic	7	4	3	1	7	0	22
	Total	15	58	31	9	44	30	187
Experiential Utility	Videogames	0	0	1	0	3	0	4
	Books	0	1	0	0	2	1	4
	TV	1	1	0	0	2	0	4
	Movies	1	1	3	0	7	1	13
	Software	2	0	1	1	2	0	6
	Music	1	12	8	5	18	3	47
	Generic	6	2	0	0	1	1	10
	Total	11	17	13	6	35	6	88
Technical Utility	Videogames	0	2	1	2	2	1	8
	Books	1	2	1	2	2	1	9
	TV	1	2	1	2	2	1	9
	Movies	0	5	10	2	9	9	35
	Software	3	16	14	1	9	3	46
	Music	1	16	21	6	30	12	86
	Generic	6	3	9	1	4	2	25
	Total	12	46	57	16	58	29	218
Social Utility	Videogames	0	1	0	0	0	0	1
	Books	1	2	0	0	0	0	3
	TV	2	2	0	0	0	0	4
	Movies	1	7	10	0	3	1	22
	Software	3	11	18	1	7	4	44
	Music	4	21	20	1	19	2	67

	Generic	8	2	8	0	8	1	27
	Total	19	46	56	2	37	8	168
Moral Utility	Videogames	0	2	0	0	0	1	3
	Books	1	2	0	0	0	0	3
	TV	1	2	0	0	0	0	3
	Movies	0	8	7	0	4	0	19
	Software	4	13	13	0	6	0	36
	Music	4	20	16	4	19	1	64
	Generic	6	5	8	0	7	0	26
	Total	16	52	44	4	36	2	154
Total Net Utility	Videogames	0	0	1	0	0	0	1
	Books	0	0	0	0	0	0	0
	TV	0	0	0	0	0	0	0
	Movies	0	1	9	0	4	0	14
	Software	0	4	16	0	10	0	30
	Music	0	2	16	3	14	0	35
	Generic	0	3	9	0	5	0	17
	Total	0	10	51	3	33	0	97

Table 8. Number of observations for each utility level, market medium and outcome measure.

6. Unlawful Downloading: Exploring the Cubic Space of Studies

6.1 Total Net Utility

Using global attitude assessments, attitudes, or reported cost-benefit assessments as a proxy for a net utility assessment, 97 outcomes were identified seeking to address whether these were linked to UFS. However these 97 outcome estimates were skewed towards music (36% of outcomes estimates), and software (31%). About half as many outcomes were relevant to movie UFS (14%), and only one was relevant to videogame UFS. No studies utilized net utility estimates to investigate e-book or TV series UFS. Moreover, 61 (63%) of the available outcome estimates utilized stated preferences or intentions as an outcome measure. While 33 outcomes (34%) referred to estimates of stated behavior, as an outcome no study and therefore no outcomes utilized observed behavior to look at total net utility estimates.

There was strong evidence to suggest that the decision to UFS was at least in part the result of a cost-benefits appraisal on the part of consumers. A total of 17 studies examined the effects of cost and

benefits assessments upon participant's stated preferences and attitudes, intentions, and stated unlawful sharing of files and legal purchase behaviors and such deliberative assessments were associated with all four outcome variables regardless of media type. Thus attitudes, intentions, and behaviors are associated with perceived costs and benefits as we suggest in our proposed conceptual framework.

A number of studies explored the relationship between attitudes regarding UFS and intent to file share or purchase (32 studies) and evidence is overwhelming for a relationship between attitudes and intentions, with only one study failing to find a relationship between the two variables (Wolfe et al., 2008). Although far fewer studies estimated the impact of attitudes directly upon stated behavior, all nine relevant samples identified a relationship between attitudes and stated UFS regardless of medium. However, only one study explored the relationship between attitudes and legal purchases, and this study failed to identify a relationship between attitudes regarding UFS and legal purchases of digital music (Fetscherin and Lattemann, 2007). Intent to file share or purchase was similarly found to be associated with stated purchasing and UFS behaviors regardless of medium. However, only nine studies estimated the relationship between intention and stated behavior. No studies examined the relationship between intentions and observed behavior. Thus, despite the uniformity of the result, there is a need for further studies which attempt to bridge the intention-behavior gap rather than utilize intentions as the measured outcome.

A final method of assessing overall evaluations about the appropriateness of UFS and legal purchases was to explore participant's willingness to pay (WTP). Hsu and Shiue (2008) found that participants with a higher WTP for software preferred legal over unlawful software, had higher legal purchase intentions, and were more likely to report having purchased legal software. There is also evidence from a further nine studies that those that engage in UFS have a lower WTP for content than those that do not; and that content that was unlawfully downloaded was valued lower than content that was purchased (Waldfoegel, 2010).

Combined, this body of evidence suggests that UFS can be a behavior that is engaged in when the utilities are thought to outweigh the likely or actual disutilities. Greater explanatory power is garnered from analysis of the net utility sources.

6.2 Legal and financial net utility

Legal and financial net utility has been comparatively heavily researched, with 187 observations investigating factors of this type. Half (50%) of these observations explored the importance of these factors upon music UFS and purchasing. The evidence base for other media types was much smaller at 19% of observations for software and 13% for movies. Only four studies explored TV series and

videogames, with three investigating e-books. There were 30 observations (16%) that estimated the relationship between legal and financial factors and observed behavior, and almost a quarter of samples (24%) used stated behavior as an outcome. Stated preferences and intentions remained common outcome measures (31% and 17% respectively),

Nine studies compared the intellectual property (IP) law strength in different nations to estimate rates of UFS or legal sales. Overall, it was found that indicators of legal strength such as membership of international treaties, and legal enforcement costs and efficiency were associated with more legal sales and lower rates of UFS. However, it is unclear that this conclusion can be accepted without further research. One possible problem is that the studies utilized estimates of UFS exclusively from the producers' side of the IP rights debates, such as the International Federation of the Phonographic Industry, Business Software Alliance, and the International Intellectual Property Alliance. A second, and more fundamental, problem is that correlation is not causation. For example, different cultural factors or economic development levels may be correlated with particular IP regimes and with particular levels of UFS. Relatedly, IP law strength was also correlated with national wealth which may confound the extent to which the two effects can be disentangled; although Walls (2008) model implies that for unlawful movie file sharing legal strength may be the more important factor. The role of national income may not be linear, with some evidence that when income is high sales of goods such as music may drop, possibly due to music being an inferior good (Long, 2011). However, for software, four studies consistently found that national income was associated with less UFS.

The evidence for the value of new laws protecting IP is limited. Adermon and Liang (2011) monitored internet traffic after a new IP law was introduced in Sweden, and compared this to Norway and Finland where no new law was introduced. Internet traffic immediately after the introduction of the new law reduced by 18%, but had recovered within 6 months of the law being passed implying the new law acted only as a short term deterrent. Blackburn (2005) similarly found that, when the Recording Industry Association of America (RIAA) announced lawsuits against individual file sharers, the availability of files on five torrent sites dropped. However, by the time lawsuits were actually being filed, overall availability of files had actually increased. Danaher et al. (2012)⁵ found that iTunes sales increased when the French public became widely aware of the incoming HADOPI law, which suggests that legal disutilities from unlawful sharing had increased legal sales. However, when the law was actually passed, no effect was observed. Of course, this may be because the French public had already fully adjusted to the policy change. One study (Bhattacharjee et al., 2006b) did find that the RIAA lawsuits reduced the number of copies of files available for UFS, but there remained a significant proportion of files available.

⁵ This paper has since been accepted for publication in the *Journal of Industrial Economics* after peer review.

An alternative approach to looking at the effect of laws upon populations is to examine the impact of deterrents upon individual attitudes and behavior. There were three groups of variables different studies considered with respect to this; those that examined the probability of capture, those that examined the severity of the consequences of capture, and those that did not distinguish between the two effects. There were 22 studies that did not distinguish between the effects of probability and severity of consequences, eight of which estimated the impact upon actual behavior. Out of these eight, four studies found a statistically significant effect upon reducing behavior, and four did not. Evidence was more convincing that a legal deterrent may lower intent to UFS, with four of five studies finding an effect, but this gap between results with intentions and results with actual behavior is worrying for drawing implications for actual behavior from studies on intentions.

Participants also stated that they did perceive laws to be a deterrent against UFS (Grolleau et al., 2008). However, in most cases this was a minority of participants and a lower proportion of participants were concerned by legal risks than were concerned by technical risks of UFS such as catching computer viruses (Ofcom, 2012, Bahanovich and Collopy, 2009). Qualitative research also emphasized that participants thought that UFS “did not feel like a crime” (BMRB Social Research, 2009), and that participants were often unaware of what was or was not unlawful (Ofcom, 2011). An additional 12 studies examined legal awareness and, while there was no clear evidence for an effect upon UFS, there was broad support for the notion that many people are unaware of what is and is not unlawful.

Studies which examined the role of probability and severity of consequences specifically, found conflicting evidence for an effect. The six studies which examined the role of severity upon stated behaviors found little evidence for any effect, with only two finding a relationship. However evidence was more consistent with regard to finding a relationship between perceived severity of punishment and attitudes about UFS, with four out of five studies finding an effect. Conversely, the probability of capture appeared to have little evidence for a relationship with attitudes regarding UFS (three of seven studies found a significant relationship) while evidence for a relationship with behavior was stronger (five of seven studies find a relationship).

There were 53 studies which examined the role of pricing, and the price of legal content was often stated as a motive for UFS in both qualitative research and surveys. However, with regard to behavior, while higher prices were uniformly related to lower legal sales, the link to UFS rates was far less clear, with only five of 11 studies finding that higher prices were associated with more UFS. In survey studies and qualitative research this is not surprising: we would expect a price effect to be observed with *real* prices and *real* budgets, and the mixed results may simply reflect the failure of relying on respondents’ introspection and engagement with hypothetical scenarios as if they were real. Although six studies did identify a relationship between higher prices and lower observed sales of music

(Montoro Pons and Cuadrado Garcia, 2008, Montoro-Pons and Cuadrado-García, 2006, Boorstin, 2004) and movies (Sung, 2007, Zentner, 2010) and TV (Danaher et al., 2010) no studies identified a relationship between higher pricing and observed UFS behavior.

There was also no clear effect from 27 studies investigating the role of individual participant's income upon UFS. Only two studies attempted to associate income with observed behavior, and one found that CD sales are correlated with income (Boorstin, 2004), while Aguiar and Martens (2013) found that income was associated with both legal online music sales and UFS music downloading. There is not an *a priori* reason to expect an income effect, but again the failure to rely on observed behavior makes the conclusion problematic.

6.3 Experiential net utility

The evidence base regarding experiential utility is the most limited in terms of number of studies, with only 88 estimates of measured outcomes identified in total. The evidence base was very heavily skewed towards music, with 53% of all identified measured outcomes exploring this media. Movies were the next most investigated media with a much lower 15% meaning the evidence base for media other than music was very limited regarding experiential utility. Only six estimates (7%) utilized observed behavior as an outcome. Most studies measured the impact of experiential factors at the level of stated behavior (40%).

One experiential factor was the interest in the product, with 20 studies exploring this possibility. Out of these 20 studies, only one estimate is based upon observed behavior (Aguiar and Martens, 2013). Qualitative research from five studies indicated that enjoying the product was a stated motive for UFS in all media, with the possible exception of software. Konstantakis et al. (2010) found that computer science students considered software to just be a tool they utilized and there was no emotional engagement with products employing this medium when compared to that with books, games, or other media. Eight studies estimated the effect of interest in music upon the amount of content purchased or unlawfully acquired. Of the four studies that investigated the role of interest upon purchases, all four found a significant positive relationship. However, five studies examined the role of interest in the product upon unlawful acquisition and only two studies found a significant positive association between the two variables (Bonner and O'Higgins, 2010, Jambon and Smetana, 2012).

Only four studies estimated the importance of the extent to which the desire to own a collection was a motive for UFS. Two studies did find that the desire to own a large collection of music was associated with the gratification felt from unlawfully obtaining content (Sheehan et al., 2012, Sheehan et al., 2010). However, (Balducci, 2009) found that 15% of her sample reported the desire to own a collection was a reason for preferring CDs over p2p files. Only Hennig-Thurau et al. (2007) estimated

the impact of desiring a large collection on actual behavior, and they found that this desire was associated with downloading more movies unlawfully but not with the number of unlawfully acquired movies that were actually watched. There is a question, of course, of whether this correlation reflects causation, or whether having a large collection because of other reasons led to post hoc justifications such as stating a desire to own a collection.

There were 13 studies that examined the extent to which the desire to gain knowledge about product content was a motive for UFS. These studies found broad support for the hypothesis that products were acquired unlawfully at least sometimes to try out content prior to purchase. Chen et al. (2008) found that a reason for preferring the use of p2p services over legal content providers was that the p2p services were considered a superior method for trying new music. Similarly, Kinnally et al. (2008) found that the motive to unlawfully acquire content in order to try new music was positively correlated with stated CD purchases.

UFS may also be utilized to obtain content that is not popular enough to be readily available legally. This possibility was explored in 16 studies. Six qualitative studies and three national surveys found support for this hypothesis with participants stating that the availability of niche content on p2p services allowed access to content that would be otherwise unavailable to them. Tzantzara and Economides (2010) had participants rank services in terms of the extent of their catalogue and found that p2p services were rated most highly while iTunes, the legal service examined, was ranked as the worst service available in this regard. Two studies provided empirical support that the belief that unlawful networks had the best selection of content was associated with using these services (Rochelandet and Le Guel, 2005, Sandulli, 2007).

As noted, this research is largely not with observed behavior, making interpretation difficult. An exception is Mateus and Peha (2008), who tracked the files that were downloaded via p2p networks on a university campus. They were able to demonstrate that content did follow a long tail distribution, implying that much downloaded content was not exceptionally popular.

6.4 Technical net utility

Technical factors associated with UFS have been relatively extensively researched, with 218 observations exploring factors of this type. Although music was still the most explored media type (39% of observed outcomes), software (21%) and movies (16%) were relatively well represented. However fewer than 10 observations each explored the influence of technical factors upon UFS and purchases of TV, videogames, and books. Stated behaviors, intentions and preferences were all explored to a similar extent (27%, 26% and 21% of outcomes respectively). There were a greater

proportion of observations utilizing observed behavior as an outcome (13%) for technical factors than other factor types, with the exception of financial and legal factors.

A technical factor closely related to interest in less popular media is the wider question of the availability of legal (particularly niche) content. This question was explored by nine studies, five of which were qualitative, a survey, and three which estimated observed behavior. The qualitative studies emphasized the impact of release lags, which was also identified as a motive for UFS in a large survey of UK residents (Ofcom, 2012). The impact of release lags received empirical support from Danaher and Waldfogel (2012), who found that longer release lags between countries for movies were associated with lower box office earnings in cinemas. Danaher et al. (2010) found that the removal of NBC content from iTunes did not affect physical DVD sales but did increase the amount of UFS activity regarding NBC content on p2p networks. This implies that the physical and digital markets may be separate, with legal downloads and unlawful downloads competing more closely than physical sales. Danaher et al. (2010) also found that uploads and downloads of non-NBC content on p2p networks increased following the removal of the legal content. This could mean that, once some users had turned to UFS, they used this medium for more than just the removed content, suggesting that there are fixed costs associated with learning to engage in UFS and, once these are taken up, the technical disutility from engaging in UFS will be lower, leading to increased UFS. In Danaher et al. (2010), the restoration of NBC content to iTunes did reduce UFS activity but not to a statistically significant degree, indicating that the removal of content had led to UFS becoming a habitual behavior.

A total of 35 studies have explored directly the hypothesis that, the easier UFS is, the greater the extent consumers engage in it. They have done so predominantly by asking participants whether they had computer or internet access, or else by estimating these variables by measuring internet and broadband penetration in a population. The evidence does not indicate that these variables had an impact upon attitudes about UFS or intent to engage in UFS. Similarly the effect upon stated behavior in 12 studies was mixed with six studies finding that technical ease of UFS was associated with UFS rates or a reduction in sales, four studies finding no effect, and two studies finding mixed effects. Mandel and Suessmuth (2012) found that having a broadband connection was associated with engaging in UFS more frequently but not to a greater extent than those without a broadband connection. With regard to observed behavior, estimates of the impact of internet or broadband penetration were that it lowers physical music sales in five of six studies, though of course this can be interpreted in terms of online sales, not necessarily in terms of UFS. The one study which found no effect, did find that there may be a relationship when IP law strength is weaker in a nation (Montoro Pons and Cuadrado Garcia, 2008). The direction of effect between broadband or internet penetration and sales was less clear for software, where a positive association between penetration and sales was found (Won and Jang, 2012), and for movies, where two out of three studies found a positive effect

upon sales (Zentner, 2010, Smith and Telang, 2010, Sung, 2007). A particular complication of using broadband or internet penetration as a measure of technical ease of UFS is that it is confounded by other variables such as legal online sales, wealth, legal strength, and national infrastructure which can all also make legal purchases and UFS more or less difficult or desirable. Similarly, there are difficulties with establishing a causal relationship between the availability of internet or broadband connections and legal or UFS.

An alternative approach was to estimate the impact of the availability of UFS technology or websites upon sales. Danaher and Waldfogel (2012) estimated the impact of the introduction of the BitTorrent protocol and found that, after its introduction, longer release windows were associated with lower box office revenues. This implied that pre-release movie UFS significantly impacted upon sales once UFS was a simpler option. Danaher and Smith (2013)⁶ explored the impact of the shutdown of a major file sharing website. The authors controlled for differences in the use of this website between countries they observed and identified a statistically significant increase in digital movie sales. However, it is impossible to determine from this study whether the observed increase would last beyond the 18 week follow up period. Poort and Leenheer (2012) found that the blocking of the Pirate Bay website had led to 21% of participants reporting less UFS, but had had no effect on 72%, while 5% said they downloaded more. One problem with these studies is that the effects may be moderated by the availability of substitute websites.

There were 33 studies which examined the relationship between perceived ability to engage in UFS. The evidence overwhelmingly indicated a relationship between perceived ability to engage in UFS and having more positive attitudes regarding UFS, and having a greater intent to file share. However only six studies estimated the impact of such perceptions upon stated behaviors. Although four of these six studies did find a positive relationship between perceived ease of UFS there is a lack of evidence based upon observed behavior.

Estimates of participant's technical skill and how this may impact upon UFS was estimated by 31 studies. Time spent on the internet may be associated with having more favorable attitudes regarding UFS, though it is unclear if this is associated with reducing the perceived difficulty of UFS or possibly relationships with other unobserved variables such as exposure to online culture affecting social and/or moral net utilities. Regarding estimates of behavior, the evidence was reasonably consistent in suggesting that greater technical skill was associated with a greater propensity to UFS. However, this was not found to be true for three studies specifically examining software UFS (Garbharan and Thatcher, 2012, Higgins and Makin, 2004, Siponen and Vartiainen, 2005).

⁶ This paper has since been accepted for publication in the *International Journal of Industrial Organization* after peer review.

One function of technical skill may be mitigating the technical risks posed by viruses and malware, which was explored by 19 studies. Qualitative studies and surveys including participants that did not file share found technical risks to be a disincentive for UFS. However, within samples of file sharers, technical risks were not consistently related to intent to file share or stated behavior. This may reflect that the perception of technical risks are more significant than the actual barriers themselves which once overcome no longer have any effect upon behavior (Liao et al., 2010); alternatively, it may once again be related to the gap between intentions and actual behavior.

Seven studies suggested that one motive for UFS was having an interest in technology. Users who file share were found to be early adopters of technology (Plouffe, 2008, Frank N. Magid Associates, 2009, Balducci, 2009) and qualitative evidence suggested that some file sharers do so to “push the envelope” (Ofcom, 2011). Relatedly, there was evidence that files acquired unlawfully were perceived as technically superior to those acquired legally. In particular UFS was perceived as being more convenient in terms of time taken to identify and acquire media and they were perceived as being more flexible with regard to how files could be manipulated and used once acquired. The use of digital rights management (DRM) and the requirement to continually relicense software products was also found to be opposed by users.

6.5 Social net utility

Sources of social net utility were investigated by 168 observations. Most of these investigated music (40% of outcome estimates) or software (26%). Movie UFS was the next most studied single media with 13% of outcome estimates concerning this media. TV series, books and videogames were investigated in less than five samples each. The most popular outcome measure was at the level of intentions (33%), although it was common the measure stated behaviors (22%) and stated preferences as an outcome (27%). Only eight outcomes were measured via observed behaviors (5%).

As well as considering how right or wrong individuals view UFS to be, an important influence could be how significant others perceive UFS. A large number of studies (78) investigated the extent to which the beliefs and behaviors of others could influence perceptions of UFS and UFS behaviors. There was widespread evidence that the perceived beliefs and behaviors of others were correlated to individual’s beliefs, intentions, and stated behaviors regarding engagement in UFS. Of course, correlation does not mean causation, and again it may be that behavior – determined by other utility sources – may be determining responses in these studies.

Taken at their face value, these studies also claim that the role of social norms may vary with context and be more influential when norms are congruent with attitudes (Higgins et al., 2007), when media is intended to be enjoyed socially rather than alone (Taylor et al., 2009), for females (Morris et al.,

2009), and in collectivist versus individualist cultures (Al-Rafee and Dashti, 2012). The role of collectivist cultures upon UFS was separately analyzed in nine studies and within these cultures UFS was perceived to be more acceptable and engaged in more frequently. Denegri-Knott (2004) analyzed statements on a website that was set up in opposition to the RIAA and found that a number of comments posted on the site made reference to the fact that the internet itself may be a collectivist culture, regardless of the fact that the participants had different perceptions regarding physical property.

An additional social motive identified for engaging in UFS was maintenance of social prestige. Maintaining or enhancing reputation through knowledge of media was identified as a motive for UFS in nine qualitative studies. The evidence for a relationship between these variables was more mixed in the quantitative literature. In particular three studies found a relationship between social status seeking and UFS and three did not. Kwan (2008) found that the relationship between the expectation of social gain from UFS and intent to file share was stronger for hedonistic media in terms of movies and music than it was for software. Social prestige may also be more important for providing content than for acquiring it (Xia et al., 2006, Xia et al., 2012), but it is very difficult to know from this literature whether and how actual behavior would change as a result of changes in this potential source of social net utility.

A final social factor that may be related to UFS and legal purchases is the formation of reciprocal relationships. Qualitative studies identified that within file sharing networks there was a sense in which those that downloaded felt that they should contribute back into the system, and some networks enforce these rules by slowing download speeds for those that don't contribute or else barring selfish users from the system entirely (Beekhuyzen et al., 2011, Holt and Copes, 2010). Similarly Lee et al. (2011) found that a sense of integration on a legal social networking site made them more likely to intend to make music available on the site. However there may be a sense that UFS networks provide a greater sense of community which appeals to some users. Plouffe (2008) found that perceiving p2p networks to have a sense of community connectedness was related to a preference for using these sites, and Plowman and Goode (2009) found that users that believe social relationships should be equitable reported more positive perceptions of UFS and greater intent to UFS. However, no studies have so far estimated the impact of reciprocity upon downloading behavior. Additionally, Cenite et al. (2009) also found via interviews with students that there was also a sense of reciprocity with creators and that content that is enjoyed should be purchased.

6.6 Moral net utility

Moral net utility was investigated by 154 observations. Music was still the most common medium investigated (42% of observations). Software was also fairly well represented in this literature (23%),

with movies being researched to a lesser extent (12%). However, it was common to not specify media types when exploring moral factors (17%). As with other factor types, videogames, TV series and books were not heavily represented being incorporated into three studies each. Measured outcomes were most commonly distributed between stated preferences, intentions and stated behaviors (34%, 29% and 23% respectively), but there was a paucity of evidence estimating observed behavior, with only two observations (1%) for this outcome measurement.

Six studies directly compared the effects of participants basing their moral beliefs more or less closely upon what was legal or not. Those participants that used the law to frame their own moral beliefs were more likely to perceive UFS as morally wrong, while in a Swedish sample that considered UFS to be morally acceptable it was the correctness of the laws that were questioned and were called “insane”, “absurd”, and “themselves illegal” (Svensson and Larsson, 2009).

Twelve studies examined the possible role different moral frameworks may have upon UFS. The contrast between absolutist versus relativist morals may have an impact upon both attitudes about and intention to engage in UFS (Aleassa et al., 2011) as well as reported behaviors (Chan and Lai, 2011). Research examining whether or not participants consider UFS to be a moral issue at all also found a division between those that utilized more absolute stances and those that instead used contextual information to inform their moral beliefs. Zamoon and Curley (2008) performed content analysis of the five most popular US newspapers, with articles on unlawful software file sharing coded according to their moral arguments for or against UFS. They found that arguments in favor of UFS were less likely than arguments against UFS to be based upon moral justifications. Arguments against UFS were instead centered upon a small number of red lines, in particular economic harms to producers. Jambon and Smetana (2012) asked participants to complete a survey when considering a scenario in which an artist receives 90% of the profits and a scenario in which industry receives 90% of the profits from sales. They found that it was argued that UFS was a personal and not a moral choice more often when artists were perceived to be the primary beneficiary of sales. It was proposed that, while arguments against UFS tend to focus on absolutes and are relatively stable, the arguments in favor of UFS are more fluid and shift depending upon context. Not considering UFS to be an ethical problem was found to be associated with UFS behaviors in both qualitative and quantitative studies (Konstantakis et al., 2010, Cockrill and Goode, 2012, Coyle et al., 2009). However, no studies attempted to observe a relationship between moral frameworks and observed behavior.

A total of 37 studies tried to estimate the relationships between moral beliefs about UFS, and various perceptions regarding UFS and behavior. Moral beliefs regarding UFS were associated with attitudinal assessments regarding the behavior in all seven studies that investigated this. The evidence regarding software UFS and studies which combine multiple media types into generic estimates was largely overwhelming in indicating that those that perceive UFS to be less moral were less likely to

intend to engage in such behavior or to engage in such behavior. Of course, this may simply be a result of a bias towards providing consistent and socially desirable responses, and may not reflect actual behavior. In contrast, the effect on studies regarding music were far less consistent, with only two out of five studies finding a relationship with intent to engage in UFS and seven out of thirteen studies finding a relationship with stated behavior. Again, no studies attempted to identify a relationship between moral beliefs regarding UFS and observed behaviors. A number of studies explored various ways participants might try to rationalize UFS behavior when this conflicts with their moral beliefs. A common framework for exploring this possibility was neutralization theory (Matza, 1964). The idea behind neutralization is that, instead of having different moral codes, those that engage in unlawful behaviors instead deviate from their own moral beliefs and rationalize these via various techniques. They are ‘denial of responsibility’ in which individuals claim their behavior was due to external forces; ‘denial of injury’ where individuals claim that their actions do not cause harm; ‘denial of the victim’ where individuals claim that any harm inflicted was not upon an innocent party; ‘condemnation of the condemners’ where those that criticize the individuals actions are accused of acting out of spite; and ‘appealing to higher loyalties’ where individuals believe their actions are for the greater good. There was partial support found for all these techniques. However, denial of responsibility, denial of injury, denial of the victim, and condemnation of the condemners were relatively weakly supported empirically for UFS and may only be relevant to those that engage in UFS infrequently (Ingram and Hinduja, 2008). Appealing to higher loyalties was a technique utilized more often by those that engaged in UFS more frequently indicating that a belief that UFS enhances social welfare may motivate such behavior (Ingram and Hinduja, 2008). There were nine studies which directly estimated this possibility and the evidence was consistent that the belief UFS enhanced social welfare was associated with attitudes, intentions, and stated behaviors regarding UFS. A further 15 studies investigated the role of participants awareness of causing harm via UFS and there was a general perception that little or no harm was caused, and while participants had more sympathy when harm was presented as being caused to creators rather than industry, there was still a perception that such harm could be absorbed easily. It is not clear from the evidence however how and whether moral reasons do make a causal difference on actual behavior.

6.7 Moderating variables

We now consider some of the moderating variables that have been considered in the literature. One is the role of past behavior. There were 36 studies which investigated the role of past behavior upon UFS. Two of these studies were qualitative. Karakaya (2011) utilized an “on-line interview form” to gather the perspectives of Turkish internet users, and a number of participants indicated that they used UFS because it was what they had always done, suggesting that legal alternatives might not even be considered. Similarly Konstantakis et al. (2010) interviewed computer science students and claims

that their participants discussed UFS as an activity that was engaged in habitually rather than rationally. It is unclear what we can infer from these conclusions. In general, economic behavior takes place not as a result of explicit deliberation but as a result of implicit learning and cognitive channels: an expert billiard player may not know the laws of physics and still excel at billiards, and vice versa a physicist may know the kinetics of the billiard and still do poorly (see Zizzo, 2003, for a longer discussion). Rational preferences may explain consistency through time and therefore are not necessarily inconsistent with habitual behavior – certainly not on the basis of the survey data of these studies and similar ones. Equally, there may be other sources of habitual behavior, such as inattention.

Higgins et al. (2007) found that the role of past behavior was only significant when participants held negative attitudes about UFS. This suggests that when individuals are generally opposed to UFS they may still do so either without realizing, because they are not aware of other options, or just because it is what they have always done. Alternatively, this points, once again, to the lack of reliability of intentions and stated preferences relative to actual behavior, which is what our conceptual framework tries to explain.

There was, in general, a correlation between past behavior and intent to engage in a behavior, with all 17 studies that investigated this link finding that past behavior was correlated with intent to engage in that behavior in future. These are however cross sectional studies and such a correlation is to be expected if subjects at least try to be consistent in terms of responses to some extent; it says nothing about whether subjects would engage in that behavior in the future. Only one study was performed which followed up an estimate of intent to engage in UFS with a later estimate of stated UFS behavior (Limayem et al., 2004), and this found relatively weak evidence of a correlation between time 1 and at time 2 three months later ($p < 0.1$).

Related to the role of past behavior and habit is the concept of self-regulation, which refers to the extent to which an individual monitors their own behavior and moderates it to ensure it is in line with personal and social standards (Bandura, 1991). Only three studies investigated the role of self-regulatory processes, but there were some indications that they may be correlated with attitudes, intentions and stated behaviors (Jacobs et al., 2012, LaRose and Kim, 2007, LaRose et al., 2005). As with past behavior, cross-sectional studies of stated behavior prohibit firm conclusions regarding the actual propensity of self-regulatory processes to influence future actual behavior. A further potential moderator is that of self-control. There were 14 studies which explored a potential role of low self-control upon decisions to engage in UFS. While there was evidence for a positive relationship between self-control, attitudes and stated behavior, evidence was most consistent with regard to a relationship with intent to engage in behavior. Moreover, the evidence indicated that self-control may operate via moderating the effects of attitudes and social norms, with self-control possibly having a

stronger effect when participants had positive attitudes regarding UFS or had peers that UFS (Higgins et al., 2006, Higgins et al., 2007, Higgins and Makin, 2004, Holt et al., 2012).

Social desirability bias is an additional potential moderator of UFS. Social desirability bias refers to the tendency of individuals to either deliberately or unconsciously modify responses so as to present themselves more positively in accordance with perceived social norms (Fleming, 2012). Very few studies have investigated the potential role of social desirability in reporting, but there is evidence that there may be correlations between such biases and reporting of attitudes and intentions regarding UFS although the direction of effect is unclear (Chan and Lai, 2011, Lu, 2009). Of potential importance, Chan and Lai (2011) found that social desirability biases were associated with lesser reporting of positive attitudes about UFS but not with reports of actual engagement in UFS behavior which may indicate that actually performing UFS is considered to be less socially taboo than believing the behavior is acceptable. However, the evidence base for these claims is far too small at just two studies from one cultural perspective (both were conducted in China).

A final moderator that may impact upon UFS is the deindividuation effect of the internet, such as the ability to be or feel anonymous, or else to adopt a different persona online. Only three studies identified in the current review have examined this phenomenon. Plowman and Goode (2009) explored the deindividuating effect of computers upon intent to download music in a sample of students. The relationship was only significant for light and heavy downloaders in their sample. With regard to a relationship with stated behaviors, neither Hinduja (2008) or Chen et al. (2008) found a significant relationship. However both studies employed relatively crude measures of anonymity (single item self-report scales). Note that, regardless of the psychological concept of deindividuation, perceptions of higher anonymity can fit within our conceptual framework as they may affect the perceived legal disutilities and riskiness from unlawful downloading.

6.8 Demographic characteristics of infringers

There were 64 studies that examined potential gender differences in UFS. Evidence was weak that there was any difference in attitudes or intentions regarding UFS between males and females. Only two of eight studies found that males had more positive attitudes about UFS than females, and three of 12 studies found the same regarding intentions. However 23 of 32 studies found that males were more likely to report engaging in UFS activity. Despite the number of studies finding no difference between the sexes it is notable that no studies find that females are more likely to engage in UFS than males. The difference between the lack of evidence for a difference in attitudes versus the more consistent evidence for a difference in behavior may reflect that males reported being more likely to engage in UFS than females even when they thought it was not acceptable behavior (Siponen and Vartiainen,

2005). It may also, and more simply, point out once again the gap between stated preferences and intentions on the one side and actual behavior on the other.

It was also noted in one study that, while men and women engaged in UFS with similar frequency, when men engaged in UFS they were more likely to download more content (Mandel and Suessmuth, 2012). However, while men may download more content, they do not necessarily consume all of this content and the amount of downloaded content actually used may be similar between genders (Huygen et al., 2009). Conversely, when tracking students' internet use, Mateus and Peha (2008) found that, while men were more likely to engage in UFS more frequently, when women engaged in UFS they were actually more likely to download more content, in contradiction to the findings of Mandel and Suessmuth (2012). Studies which examined WTP in music found that women were more likely to have a higher WTP in two of three studies, while one study found that men had a higher WTP for software. However, men were always more likely to have a WTP of zero and Waldfogel (2010) found that men were more likely to file share when their WTP was closer to the asking price of music. Overall, there is no consistent evidence of WTP differences between men and women.

There were 57 studies that examined the relationship between age and UFS, but a core problem with this body of research was a heavy use of student samples. Such samples often failed to find a relationship between age and UFS, but of course had only limited variance in ages. However, when studies used samples drawn from the general population which were more likely to have a wider spread of ages included, then it was fairly clear that older participants were less likely to have positive attitudes about UFS and less likely to report engaging in such behaviors. One exception to this was a study by Malin and Fowers (2009) who found that in high school students, it was older participants that had more positive attitudes regarding UFS. This may suggest that it is during adolescence that attitudes regarding UFS begin to form.

The effect of education level on UFS was explored by 14 studies. No obvious relationship between UFS and education was found. As with studies exploring age, the use of student samples limits the variability in participants making identifying relationships difficult. It may be that more education is associated with less UFS (Fetscherin and Lattemann, 2007, Rochelandet and Le Guel, 2005, Aguiar and Martens, 2013), or that the relationship between education and downloading is not linear with UFS peaking for those with a moderate level of education (Cox et al., 2010, Nandi and Rochelandet, 2008), or that the identified relationships are spurious or related to covariance with other variables such as income.

A final demographic variable investigated by 17 studies was the potential relationship between ethnicity and UFS. No evidence was available for the relationship between ethnicity and attitude, apart from one study which compared ethnic groups in Nigeria finding no difference (Ilevbare, 2008). The six studies which explored the relationship between ethnicity and intent to download, split

categories into white and non-white which limits any conclusions that can be made. As it is, no clear evidence for any difference was found with two studies finding white participants engaged in more UFS, three finding non-white participants engaged in more UFS, and six studies not finding any significant difference. The definitions used for ethnicity regarding stated behaviors of participant are less consistent and so less open to direct comparison. However, three studies did find that Asian participants were more likely to report UFS, though the difference in reported behavior may not correspond to a difference in actual behavior.

7. Discussion

7.1 A scoping review methodology

We employed a scoping review methodology to consider the welfare implications of UFS and the determinants of the decision to engage in unlawful downloading. We did so to reduce the risks of bias that would otherwise be present when looking at a vast and diverse literature. A key contribution of our paper is methodological: we are the first to apply a scoping review methodology to look at these issues, the controversial nature of which makes them especially prone to potential biases by reviewers.

Scoping reviews reduce biases associated to narrative biases, such as preferences bias, availability biases, cognitive dissonance, selective exposure and confirmation bias. We cannot, of course, entirely rule out sources of bias from the process (Egger et al., 1997, Song et al., 2010). While the adoption of a scoping review relative to a systematic review approach was demanded by the breadth of the remit, we also recognize that, relative to the more tightly defined systematic review, we may have failed to identify all relevant studies and so there is a risk that potentially key evidence is omitted. This risk of bias is somewhat exacerbated because the current review was only able to process reports written in the English language. Given that the relative importance of different correlates of UFS have been demonstrated to vary between cultures, an English language only sample may overemphasize the importance of those variables that are strongest in Western societies, and in the UK and USA in particular. While obviously further research may want to build and improve on what we have done, we believe that the current review provides the most comprehensive, transparent, and systematic overview of the current evidence base for the determinants and implications of UFS.

7.2 The impact of unlawful file sharing on welfare

The empirical welfare implications of unlawful downloading remain unclear on the basis of the existing evidence.⁷ Two approaches have been followed: one based on impact of UFS on sales of legal goods and overall consumption, and one based on willingness to pay (WTP) measures for unlawful copies. The first approach is focused on the supply side rather than on the demand side, i.e. the welfare gains that consumers may obtain by unlawful downloading as well as by legal purchases, and so can only provide a partial welfare perspective on the impact of UFS. It also suffers from severe identification problems. The second approach focuses on consumer welfare using WTP measures, but this data is unincentivized and conceivably likely to lead to consumer evaluations that are upwardly biased; it may also be sensitive to the sample used. Moreover very few studies have adopted this approach. The rest of this sub-section elaborates on some of these issues.

The types of data available to researchers are largely inadequate for the task of reliably estimating the impact of UFS on sales (Towse et al., 2008). Most studies exploring harm rely upon the stated behavior of participants, not observed behavior. Therefore the conclusions may be limited to a particular sample given observed differences in UFS rates between nations and subsections of the population such as students. The impacts of UFS may differ depending upon culture (Bai and Waldfogel, 2012) or between different communities within a culture such as students (Rob and Waldfogel, 2007). Furthermore the types of observed data available to researchers are not necessarily any more robust. Industry provided estimates of sales or UFS rates are often difficult or impossible to verify (Towse et al., 2008).

A second problem involves the economic techniques utilized to estimate harm and the sensitivity of results to the choice of instrumental variables. The lack of verifiably adequate controls in natural experiments, cross-country comparisons, and models utilizing instrumental variables make attributions of cause and effect extremely tenuous and have unsurprisingly led to a range of different estimated effect sizes for the impact of UFS. Prior reviews have focused upon the literature predominantly finding a negative effect of UFS on sales to suggest that the probability is that it is harmful (Smith and Telang, 2012, Liebowitz, 2011, Png, 2006). However, such a ‘vote counting’ approach to summarizing literature can be misleading (Bushman and Wang, 2009), and there are further caveats which make such a confident conclusion unwarranted. The first is that the evidence base is extremely heavily skewed towards music, with somewhat less research on movies, and almost no research for other markets. Given that the current estimates of the effect of UFS on sales appear to

⁷ As noted by Joost Poort in personal communication, and implied by the basic microeconomic definition of welfare in section 4, in a static setting the implications of UFS cannot but be positive, since all they can do is to increase consumer surplus. However, from a theoretical viewpoint, there is ambiguity once the dynamic implications of UFS are taken into account. The focus of this scoping review has been on the existing empirical evidence

be less unanimously detrimental for movies than for music (Dejean, 2009), it may be unwise to base any general response upon evidence from only one market. Much more research is required for the existence of any beneficial or detrimental effect of UFS upon other industries. A second caveat is that the definition of harm adopted by the current studies is extremely narrow and in most cases limited to physical sales, and the somewhat fewer studies that investigate digital sales. Future attempts to empirically estimate the impact of UFS should take into account the diverse range of funding sources for modern media including digital streaming services and crowd funding projects which all contribute to the creative economy in addition to physical and digital sales. The impacts of UFS should also be considered more widely and the welfare implications to various relevant agents considered, with the impact upon artists and creators a significant omission from much of the literature (Towse, 2006). For example, it has been argued that a significant part of the value of cultural goods exists in the extent to which they can be shared and enjoyed (Rodman and Vanderdonckt, 2006).

While the WTP studies suggest a positive welfare benefit from UFS, this data too has serious problems. First, these welfare estimates were based exclusively upon the music industry which may not be representative of all markets. Second, displacement rates of unlawful files upon legal files for estimating welfare effects were calculated for students only, which may not generalize to wider populations in different nations as assumed by van Eijk et al. (2010). Third, the studies do not incentivize their estimates of WTP, with no actual money at stake and with reliance on purely hypothetical scenarios. This limits the validity of the findings (Hensher, 2010). Given the subject of investigation, it is hard to deny the likelihood that WTP estimates are substantially biased upwards. Fourth, the estimates assume that music production is not affected by UFS and the literature on the extent to which this is the case is in its infancy (Waldfogel, 2011); at present the supply side is largely neglected. Crucially, this means that studies utilizing the welfare approach could only conceivably identify a positive welfare effect. Downloads which replace sales are translated as a direct transfer of welfare from producers to consumers, while downloaded files that do not replace sales generate welfare gain. It is only by incorporating the dynamic effects of this transfer of welfare from producers to consumers upon the generation and distribution of content that any potential decline in welfare could be detected.

Both the sales and the WTP approaches are static, in that they do not try to estimate the long-term implications that having a market with strong property rights or conversely with business models based on more open access would have on welfare; these would have to be factored in in any welfare analysis.

We conclude that the debate regarding whether or not UFS is harmful remains one that cannot claim to have been settled either way. Given the difficulty of acquiring reliable data and the complexity of

modeling the relevant factors comprehensively, it would take a significant input of resources and cooperation from those on all sides of the debate before studies could begin to be produced which could feasibly provide more robust answers to this question.

7.3 Unlawful downloading: a conceptual framework and evidence

We presented a conceptual framework modeling the decision by a consumer whether to obtain an unlawful copy, do nothing or purchase a legal copy of the product. We model this as the outcome of potentially as many as five different sources of utilities and disutilities: financial and legal net utility; experiential net utility; technical net utility; social net utility; and moral net utility. This allowed us to map the evidence from our scoping review into a cubic representation along the three dimensions of net utility source; market medium; and outcome measure, where the quality of quantitative measures is measured relative to the ideal of observed behavior. Our focus is on the unlawful downloading dimension rather than the uploading dimension of UFS, though some of our discussion about the former also relates to the latter. We also note that our conceptual framework would have obvious implications for policy depending on what persuasive evidence can be found for one or another net utility source and market medium. For example, if there were persuasive evidence for net social utility mattering, this could validate policy interventions to reduce UFS based on shifting the perception of the social norms.

A first key stylized fact from our representation of the space of evidence is the comparative scarcity of studies that employ observed behavior as a measured outcome, whether from the experimental laboratory or from the natural world. This scarcity is especially severe in the context of moral net utility but also experiential net utility and social net utility. This makes conclusions along the lines of Svennson and Larsson (2009) arguing that stronger IP laws may be ineffective if set against the moral beliefs or social norms of the society, virtually impossible to evaluate at present. The reason for the limited use of observed behavior as the measured outcome may reflect on the one side the lack of familiarity with laboratory experimental methods in most of the literature, and on the other side the ethical and technical complexities of observing unlawful behavior in a manner that has little to no risk for participants whilst providing robust empirical evidence. Nonetheless this quality of evidence is necessary if the objective is to state with confidence which variables can be demonstrated to be causally associated with UFS behavior. The focus upon intent to file share as an outcome is also somewhat concerning given that very few studies seek to establish a relationship between intentions and stated behavior, and given that that some variables, including legal deterrents, may impact upon intentions more strongly than they do upon actual behavior.

The second key stylized fact concerns the fact that the vast majority of the studies employ cross sectional surveys which make attributions of causality extremely difficult. There is a clear need for

longitudinal studies to better determine causality links, e.g. from stated moral beliefs into future behavior while controlling for past behavior.

The third key stylized fact is that the UFS debate seems to have been played out largely, in relation to evidence, in terms of music files. Movies and software are a distant second, and not well represented for all potential net utility sources. There is very little on videogames, books, or TV content, and the pornography market was ruled out from our cubic representation as we found no studies on it. One study does hint at the consequences of ignoring pornography as a media. Mateus and Peha (2008) find that for participants that use p2p networks to access pornography, 96% of users also download other copyrighted material compared to 65% of users that do not use p2p networks to download pornography. This may indicate that accessing pornography might be a very significant motivator for use of file sharing networks. Another example of a notable gap is videogames, traditionally seen as a past-time associated with technically savvy younger adults. The extremely limited evidence identified suggests that despite their technical knowhow, videogame players may choose to not file share, or at least do so to a far lesser extent than consumers of other media (Fukugawa, 2011). This finding requires replication, and, if found to be robust, the reasons for this could be valuable information for those seeking to encourage legal sales in other media.

A fourth key stylized fact is the comparatively widespread use of generic estimates of UFS that are not specific to particular media. It is a general principle of research design that dependent variables should be as specific as possible so as to reduce measurement error and improve the reliability of estimates. The current review has highlighted that the different elements of the proposed utility model may vary in importance depending upon media, and further that the consequences of UFS may also differ between media. Therefore it would appear to be problematic to assume that the motives and consequences of UFS are identical between media; given this, the use of generic dependent variables is a limitation and future studies should specify which media are of interest.

A fifth key stylized fact is the prevalence of student samples in the UFS literature. Students may indeed engage in considerable UFS. That said, this may be a case where drawing inferences from a student population to a non-student population may lead to a too partial understanding of the determinants of UFS behavior (Henrich et al., 2010). This is perhaps more likely to be the case for potential net sources of utility such as net social utility or net moral utility.

The first requirement for further testing is to demonstrate that the factors proposed to feed into the net utility estimates can be empirically demonstrated to function as hypothesized. This challenge will be best met by large survey studies indicating that the proposed relationships are genuine, alongside targeted studies testing the individual relationships such that they can be shown to be causal in nature and not due to shared covariance with other factors. These aims are best met through laboratory or field experimental methods.

8. Conclusions

We employed an innovative scoping review methodology to consider and assess the existing evidence on the consequences and determinants of UFS in as a systematic and transparent way as possible. Of course, research on UFS is continuing beyond the period considered in this scoping review.⁸ Whether UFS is bad for welfare remains unclear based on the evidence available from our scoping review, with both of the approaches employed – the sales approach and the willingness to pay approach – suffering from serious limitations. Almost all of the research is focused on music followed by movies as distant second, and with almost no studies concerning other market mediums such as videogames, books, software and TV.

We presented a conceptual framework that considers the decision of a consumer to engage in unlawful downloading, purchase a legal copy or do nothing, depending on the utilities and disutilities obtained from five sources (legal and financial, experiential, technical, social and moral). This framework enables us to represent the studies on the determinants of UFS along the three dimensions of a ‘cubic’ space, where the dimensions are the net utility source, the market medium and the outcome measure. There is a scarcity of studies on observed behavior and this becomes particularly even more severe for potential moral, experiential and social utility sources. There is an over-reliance on cross-sectional studies relying largely on stated preferences, intentions, or at best stated behavior. Once again, the UFS debate seems to have been played out largely, in terms of evidence, in terms of music files. Movies and software are a distant second, and not well represented for all potential net utility sources. There is very little on, for example, videogames, books, or TV content. Student samples are employed in a majority of studies.

There is a definite need of more experimental and longitudinal samples capable of identifying causality links and starting to assess the potential of policy changes to affect UFS behavior. There is also a need to explore, more systematically, a wider spectrum of markets, as IP frameworks do not normally differentiate across markets. Policies and assessments purely considered in terms of music files, or even a combination of music files and movies, may not be fit for purpose when considering other markets.

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⁸ For example, a recent paper by Poort et al. (2014) looks at the effects of legally blocking access to the Pirate Bay in the Netherlands. A survey was carried out by Karaganis and Renkema (2013) which compared copying in the US and Germany. Neither the paper nor this survey contradict the findings presented in our review.

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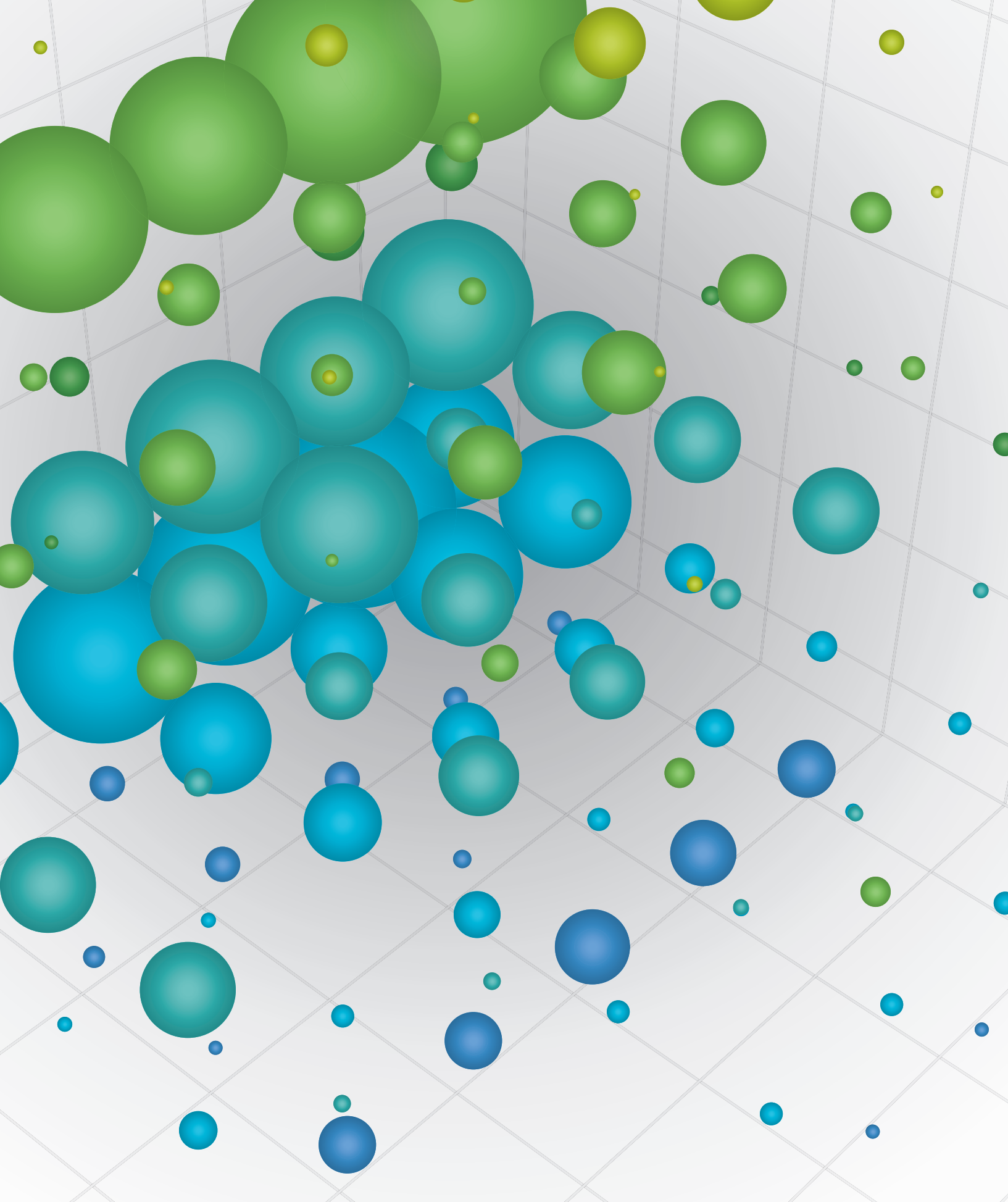
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RCUK Centre for Copyright and
New Business Models in the
Creative Economy

College of Social Sciences / School of Law
University of Glasgow
10 The Square
Glasgow G12 8QQ
Web: www.create.ac.uk





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